



## WOAH List of Antimicrobial Agents of Veterinary Importance (January 2025)

The WOA<sup>1</sup> International Committee unanimously adopted the List of Antimicrobial Agents of Veterinary Importance at its 75<sup>th</sup> General Session in May 2007 ([Resolution No. XXVIII](#)).

### 1. Background

Antimicrobial agents are essential drugs for human and animal health and welfare. Antimicrobial resistance is a global public and animal health concern that is influenced by both human and non-human antimicrobial usage. The human, animal and plant sectors have a shared responsibility to prevent or minimise antimicrobial resistance selection pressures on both human and non-human pathogens and reduce the spillover of antimicrobial resistance into the environment.

The FAO<sup>2</sup>/OIE /WHO<sup>3</sup> Expert Workshops on Non-Human Antimicrobial Usage and Antimicrobial Resistance held in Geneva, Switzerland, in [December 2003](#) (Scientific Assessment) and in Oslo, Norway, in [March 2004](#) (Management Options) recommended that WOA<sup>1</sup> should develop a list of critically important antimicrobial agents in veterinary medicine and that WHO should also develop such a list of critically important antimicrobial agents in human medicine.

Conclusion No. 5 of the Oslo Workshop is as follows:

5. The concept of “critically important” classes of antimicrobials for humans should be pursued by WHO. The Workshop concluded that antimicrobials that are critically important in veterinary medicine should be identified, to complement the identification of such antimicrobials used in human medicine. Criteria for identification of these antimicrobials of critical importance in animals should be established and listed by OIE. The overlap of critical lists for human and veterinary medicine can provide further information, allowing an appropriate balance to be struck between animal health needs and public health considerations.

Following this recommendation, WOA<sup>1</sup>'s ad hoc Group on antimicrobial resistance began working on this topic in November 2004. The terms of reference, aim of the list and methodology were endorsed by the Biological Standards Commission in its January 2005 meeting and adopted by the International Committee in May 2005.

### 2. Preparation of the draft list

The Director General of WOA<sup>1</sup> sent a questionnaire prepared by the *ad hoc* Group accompanied by a letter explaining the importance of the task to all WOA<sup>1</sup> Delegates and international organisations, having signed a Co-operation Agreement with WOA<sup>1</sup> in August 2005.

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<sup>1</sup> World Organisation for Animal Health (founded as OIE).

<sup>2</sup> FAO: Food and Agriculture Organization of the United Nations

<sup>3</sup> WHO: World Health Organization

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Sixty-six responses were received. This response rate highlights the importance given by WOA H Members from all regions to this issue. These replies were analysed first by WOA H's Collaborating Centre for Veterinary Medicinal Products<sup>4</sup>, then discussed by the *ad hoc* Group at its meeting in February 2006. A list of proposed antimicrobial agents of veterinary importance was compiled together with an executive summary. This list was endorsed by the Biological Standards Commission and circulated among Members aiming for adoption by WOA H International Committee during the General Session in May 2006.

### 3. Discussion at the 74th International Committee in May 2006

The list was submitted to the 74th International Committee where active discussion was made among Members. Concerns raised by Members include: 1) the list includes substances that are banned in some countries; 2) some of the substances on the list are not considered "critical"; 3) nature of the list – is this mandatory for Members?; and 4) the use of antimicrobial agents as growth promoters is included. While many Members appreciated the work, it was considered appropriate to continue refinement of the list. The list was adopted as a preliminary list by [Resolution No. XXXIII](#).

### 4. Refinement and adoption of the List of Antimicrobial Agents of Veterinary Importance

The *ad hoc* Group was convened in September 2006 to review the comments made at the 74th General Session of WOA H International Committee, and [Resolution No. XXXIII](#) adopted at the 74th General Session. Based on the further analysis provided by WOA H's Collaborating Centre for Veterinary Medicinal Products, the *ad hoc* Group prepared its final recommendations of the List of Antimicrobial Agents of Veterinary Importance together with an executive summary. Once again, this was examined and endorsed by the Biological Standards Commission in its January 2007 meeting and circulated among Member Countries. The refined List was submitted to the 75th International Committee during the General Session in May 2007 and adopted unanimously by [Resolution No. XXVIII](#).

The List was further updated and adopted in May 2013, May 2015 and May 2018 by the World Assembly of WOA H Delegates.

In July 2018, the *ad hoc* Group conducted a technical review of the List to improve coherence between the WHO and WOA H List with respect to terminology used for antimicrobial classification, and this revision was endorsed by the Scientific Commission in February 2019. The report of the Scientific Commission to the WOA H World Assembly of Delegates is detailed in the 86th General Session Final Report.

### 5. Revision of the List of Antimicrobial Agents of Veterinary Importance

#### 2007

The Joint FAO/WHO/OIE Expert Meeting on Critically Important Antimicrobials held in Rome, Italy, in November 2007, recommended that the List of Antimicrobial Agents of Veterinary Importance (hereafter referred as 'The WOA H List') should be revised on a regular basis and that WOA H further refine the categorisation of antimicrobial agents, with respect to their importance in the treatment of specific animal diseases.

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<sup>4</sup> French Agency for Food, Environmental and Occupational Health & Safety (ANSES) and French Agency for Veterinary Medicinal Products (ANMV), Fougères, France

## 2012

The WOAH *ad hoc* Group on Antimicrobial Resistance met in July 2012 to review and update the WOAH List taking into account changes in the categorisation of critically important antimicrobial agents of the WHO list of Critically Important Antimicrobials for Human Medicine.

## 2018

The WOAH *ad hoc* Group on Antimicrobial Resistance met in January 2018 to review and update the WOAH List taking into account:

- the Global Action Plan on Antimicrobial Resistance supporting the phasing out of use of antimicrobials for animal growth promotion in the absence of risk analysis;
- the [Resolution N° 38](#) adopted by the WOAH World Assembly of Delegates in May 2017;
- the fifth revision of the WHO list of Critically Important Antimicrobials for Human Medicine (2016) moving Colistin among the Highest Priority Critically Important Antimicrobials; and
- the WOAH report on antimicrobial agents intended for use in animals (Second Report), in particular the antimicrobial agents used as growth promoters (English version, page 30, figure 5)

The *ad hoc* Group made recommendations for the use of the updated WOAH list.

## 2019

The Director General established the Working Group on Antimicrobial Resistance following the adoption of [Resolution No. 14](#) at the 87th WOAH General Session. The Working Group replaced the *ad hoc* group on Antimicrobial Resistance to:

- ensure the sustainability of WOAH's [Strategy on Antimicrobial Resistance and Prudent Use](#)
- implement the [recommendations](#) made during WOAH's 2<sup>nd</sup> Global Conference on Antimicrobial Resistance.

## 2021

Editorial changes in the WOAH List were made public at the 2021 General Session. These changes addressed the incorrect spelling of some antimicrobial agents and an out-of-date reference to Chapter 6.9, which was updated to Chapter 6.10.

## 2024

The Working Group on Antimicrobial Resistance revised the recommendations section of the WOAH List and endorsed it during its biannual meeting in February 2024. The Working Group took into account during the revision the new categorisation criteria of the [WHO List of Medically Important Antimicrobials](#) that now include the [AWaRe classification](#) and the [WHO Essential Medicines List](#), which resulted in the move of phosphonic acid derivatives (e.g., Fosfomycin) among Highest Priority Critically Important Antimicrobials (HPCIA).

The Working Group on Antimicrobial Resistance made recommendations for the use of the updated WOAH List.

In its biannual meeting in October 2024, the Working Group recommended that the WOAHL List should be updated taking into account the latest technical reference documents on antimicrobial agents of veterinary importance available so far for poultry, swine, aquatic animals, bovine and cats and dogs. Furthermore, the Working Group recommended that a new 'Purposes' section should be added to the WOAHL List and technical reference documents to provide guidance on how Members should use these guidance documents at national level.

## 6. Scope

The objective of the WOAHL List is to provide information on antimicrobial agents and classes authorised for use in animals and their importance for treating common infectious diseases in animals, without serving as a treatment guideline.

The WOAHL List can help and support Members when

- **evaluating access** to veterinary medicinal products needed to treat common infectious diseases, taking into consideration their importance for animal and public health;
- developing and updating national guidelines for responsible antimicrobial use and advice for best practice management;
- conducting risk management on AMU and AMR, and risk prioritisation to minimise and contain AMR;
- conducting the selection of antimicrobial agents and classes in national surveillance systems for antimicrobial use (AMU) and AMR in animals, and in the reporting of AMU data in animals to WOAHL's [ANIMUSE](#) in alignment with the WOAHL's [Strategy for Antimicrobial Resistance and Prudent Use of Antimicrobials](#).

The WOAHL List:

- Addresses antimicrobial agents authorised for use in food-producing and non food-producing animals
- Does not include antimicrobial classes/sub classes only used in human medicine
- Includes only antimicrobial agents authorised for veterinary medical use<sup>5</sup> or for dual purpose (i.e., veterinary and non-veterinary medical use)
- Does not include antimicrobial agents authorised solely for growth promotion purposes (i.e., non-veterinary medical use)
- Focuses currently on antibacterials and antibacterials that are also have antiparasitic activity (e.g., protozoa) agents used in veterinary medicine.
- Includes only antimicrobial agents that are authorised for systemic use as sole agent or as part of well-established combinations
- Includes antimicrobials that are authorised for topical use as sole agent or as part of combination with other antimicrobial agents, when justified by evidence of mixed infections in particular organs.

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<sup>5</sup> WOAHL TAHC, [Chapter 6.9. Monitoring of the quantities and usage patterns of antimicrobial agents used in food-producing animals](#).

It should be kept in mind that the antimicrobials listed in the WOH List may not all be available in all countries, or be appropriate for use in all stages of the life and/or production cycle of the animal or groups of animals considered.

Extra-label/off-label use of antimicrobial agents may be common and allowed in specific species (e.g., cats and dogs) and in specific contexts in some countries, territories and/or regions. It is recognised that the legal frameworks and contexts in which veterinarians and other animal health professionals operate are very diverse in terms of legislation frameworks concerning licensing, access, and extra- or off-label use of human and/or veterinary medicinal products, and patterns and extent of antimicrobial resistance of bacteria of animal and public health interest may vary considerably across countries, territories and regions.

## CRITERIA USED FOR CATEGORISATION OF VETERINARY IMPORTANT ANTIMICROBIAL AGENTS

In developing the WOAH List, the *ad hoc* Group agreed that any antimicrobial agent authorised for use in veterinary medicine according to the criteria of quality, safety and efficacy as defined in the *Terrestrial Animal Health Code* (Chapter 6.10. Responsible and prudent use of antimicrobial agents in veterinary medicine) is important. Therefore, based on WOAH Member contributions, the Group decided to address all antimicrobial agents used in food-producing animals to provide a comprehensive list, divided into critically important, highly important and important antimicrobial agents.

In selecting the criteria to define veterinary important antimicrobial agents, one significant difference between the use of antimicrobial agents in humans and animals has to be accounted for the many different species that have to be treated in veterinary medicine.

The following criteria were selected to determine the degree of importance for classes of veterinary antimicrobial agents.

### Criterion 1. Response rate to the questionnaire regarding Veterinary Important Antimicrobial Agents

This criterion was met when a majority of the respondents (more than 50%) identified the importance of the antimicrobial class in their response to the questionnaire.

### Criterion 2. Treatment of serious animal disease and availability of alternative antimicrobial agents

This criterion was met when compounds within the class were identified as essential against specific infections and there was a lack of sufficient therapeutic alternatives.

On the basis of these criteria, the following categories were established:

- Veterinary **Critically Important Antimicrobial Agents (VCIA)**: are those that meet **BOTH** criteria 1 **AND** 2
- Veterinary **Highly Important Antimicrobial Agents (VHIA)**: are those that meet criteria 1 **OR** 2
- Veterinary **Important Antimicrobial Agents (VIA)**: are those that meet **NEITHER** criterion 1 **NOR** 2

### **Recommendations**

Any use of antimicrobial agents in animals should be in accordance with the WOAH Standards on the responsible and prudent use laid down in Chapter 6.10 of the *Terrestrial Animal Health Code* and in the Chapter 6.2. of the *Aquatic Animal Health Code*.

The responsible and prudent use of antimicrobial agents does not include the use of antimicrobial agents for growth promotion in the absence of risk analysis.

According to the criteria detailed above, antimicrobial agents in the WOAH List are classified according to three categories, Veterinary Critically Important Antimicrobial Agents (VCIA), Veterinary Highly Important Antimicrobial Agents (VHIA) and Veterinary Important Antimicrobial Agents (VIA).

However, a specific antimicrobial/class or subclass may be considered as critically important for the treatment of a specific disease in a specific species (See specific comments in the following table of categorisation of veterinary important antimicrobial agents for food-producing animals).

For a number of antimicrobial agents, there are no or few alternatives for the treatment of specific disease(s) in identified target species as it is indicated in the related comments in the WOAHL List. In this context, particular attention should be paid to the use of VCIA and of specific VHIA.

In the WOAHL List, some antimicrobial classes, subclasses and specific antimicrobial agents are considered to be Highest Priority Critically Important (HPCIA) by WHO; this is currently the case for Fluoroquinolones, third and fourth generation Cephalosporins, Colistin (Polymyxin E) and Phosphonic acid derivatives (e.g., Fosfomycin). Therefore, HPCIA should be used according to the following recommendations:

- Not to be used for prevention in an individual or group of animals at risk of acquiring a specific infection or in a specific situation where infectious disease is likely to occur if the drug is not administered.
- Not to be used as a first line treatment unless justified, when used as a second line treatment, it should ideally be based on the results of bacteriological tests; and
- Extra-label/off-label use should be limited and reserved for instances where no alternatives are available and in agreement with the national legislation in force; and
- Urgently prohibit their use as growth promoters.

The classes in the WHO category of HPCIA should be the highest priorities for countries in phasing out use of antimicrobial agents as growth promoters.

The WOAHL List of antimicrobial agents of veterinary importance is based on expert scientific opinion and will be regularly updated when new information becomes available.

Antimicrobial classes / sub classes used only in human medicine (e.g., carbapenems) are not included in the WOAHL List. Recognising the need to preserve the effectiveness of these antimicrobial agents in human medicine, careful consideration based on risk assessment and existing evidence should be given regarding their potential use (including extra-label/off-label use) or authorisation for use in animals or both.

## Abbreviations

Animal species in which antimicrobial agents are used and categories of antimicrobials of veterinary importance are abbreviated as follows:

AVI: Avian	EQU: Equine	VCIA: Veterinary Critically Important Antimicrobial Agents
API: Bee	FEL: Feline	VHIA: Veterinary Highly Important Antimicrobial Agents
BOV: Bovine	LEP: Rabbit	VIA: Veterinary Important Antimicrobial Agents
CAN: Canid	OVI: Ovine	
CAP: Caprine	PIS: Fish	
CAM: Camel	SUI: Swine	
CRU: Crustaceans		

## CATEGORISATION OF VETERINARY IMPORTANT ANTIMICROBIAL AGENTS AUTHORISED FOR USE IN ANIMALS

Antimicrobial Agents (Class, Subclass and Substance by International Nonproprietary Name [INN])	Species	Specific comments	VCIA	VHIA	VIA
<b>AMINOCOUMARIN</b>		Aminocoumarins are used in:			
Novobiocin (vet only)	AVI, CAP, OVI	<ul style="list-style-type: none"> <li>- <b>Poultry:</b> staphylococcal infections;</li> <li>- Small ruminants: mastitis (topical use)</li> </ul> <p><b>This class is currently only used in animals.</b></p>			X
<b>AMINOCYCLITOL</b>					
Spectinomycin	AVI, BOV, CAN, CAP, EQU, FEL, LEP, OVI, SUI	<p>The wide range of applications and the nature of the diseases treated make aminocyclitols extremely important for veterinary medicine when there are few economical alternatives available.</p> <p>Aminocyclitols are used in:</p> <ul style="list-style-type: none"> <li>- <b>Bovine animals:</b> respiratory infections</li> <li>- <b>Cats and dogs:</b> respiratory, gastrointestinal, urinary and, skin infections</li> <li>- <b>Poultry:</b> gastrointestinal and systemic infections</li> <li>- <b>Swine:</b> gastrointestinal and respiratory infections</li> </ul>	X		
<b>AMINOGLYCOSIDES</b>					
Dihydrostreptomycin	AVI, BOV, CAN, CAP, EQU, FEL, LEP, OVI, SUI	<p>The wide range of applications and the nature of the diseases treated make aminoglycosides extremely important for veterinary medicine when there are few economical alternatives available.</p>			
Streptomycin	API, AVI, BOV, CAN, CAP, EQU, FEL, LEP, OVI, SUI				
<b>AMINOGLYCOSIDES + 2 DEOXYSTREPTAMINE</b>		Aminoglycosides are used in:			
Amikacin (synonyms: amikacillin, ampicillin)	BOV, CAN, EQU, FEL	<ul style="list-style-type: none"> <li>- <b>Crustaceans and fish:</b> infections caused by <i>Aeromonas</i> spp., <i>Edwardsiella</i> spp. and <i>Vibrio</i> spp.</li> <li>- <b>Poultry:</b> gastrointestinal and skin infections; histomoniasis.</li> </ul>	X		
Apramycin (vet only)	AVI, BOV, LEP, OVI, SUI				
Astromycin (synonym: fortimycin)	LEP, OVI				
Framycetin	CAN, CAP, FEL, OVI				



Antimicrobial Agents (Class, Subclass and Substance by International Nonproprietary Name [INN])	Species	Specific comments	VCIA	VHIA	VIA	
Gentamicin	AVI, BOV, CAM, CAN, CAP, EQU, FEL, LEP, OVI, SUI	<ul style="list-style-type: none"> <li>- <b>Bovine animals:</b> gastrointestinal infections; mastitis (topical use).</li> <li>- <b>Cats and dogs:</b> systemic infections caused by Gram negative bacteria; ophthalmic infections and otitis (topical use)</li> <li>- <b>Swine:</b> gastrointestinal and respiratory infections</li> </ul>				
Kanamycin	AVI, BOV, CAN, EQU, FEL, SUI					
Neomycin	API, AVI, BOV, CAN, CAP, CRU, EQU, FEL, LEP, OVI, PIS, SUI					
Paromomycin	AVI, BOV, CAN, CAP, FEL, LEP, OVI, SUI					
Tobramycin (synonym: tobramicin)	CAN, EQU, FEL					
<b>AMPHENICOLS</b>		<p>The wide range of applications and the nature of the diseases treated make amphenicols extremely important for veterinary medicine when there are few economical alternatives available.</p> <p>Amphenicols are used in:</p> <ul style="list-style-type: none"> <li>- <b>Bovine animals:</b> hoof and respiratory infections</li> <li>- <b>Cats and dogs:</b> respiratory and skin infections;</li> <li>- <b>Dogs:</b> ophthalmic infections and otitis (topical use);</li> <li>- <b>Fish:</b> wide range of bacterial diseases for which there are currently no or very few treatment alternatives;</li> <li>- <b>Poultry:</b> respiratory infections</li> <li>- <b>Swine:</b> respiratory infections</li> </ul>	X			
Chloramphenicol	CAN, FEL					
Florfenicol (vet only)	AVI, BOV, CAN, CAP, CRU, EQU, FEL, LEP, OVI, PIS, SUI					
Thiamphenicol	AVI, BOV, CAN, CAP, FEL, OVI, PIS, SUI					
<b>ANSAMYCIN – RIFAMYCINS</b>		<p>This antimicrobial class is authorised for veterinary use only in a few countries.</p>		X		
Rifampicin (synonym: rifampin)	EQU					

Antimicrobial Agents (Class, Subclass and Substance by International Nonproprietary Name [INN])	Species	Specific comments	VCIA	VHIA	VIA
Rifaximin	BOV, CAN, CAP, EQU, FEL, LEP, OVI, SUI	<p>Ansamycins are used in:</p> <ul style="list-style-type: none"> <li>- <b>Bovine animals:</b> mastitis (topical use).</li> <li>- <b>Cats and dogs:</b> skin and other integumental infections (topical use).</li> <li>- Equine: <i>Rhodococcus equi</i> infections in foals.</li> <li>- <b>Swine:</b> skin conditions (topical use)</li> </ul>			
<b>ARSENICALS</b>					
Nitarsone (vet only)	AVI, SUI	<p>Arsenicals are used in:</p> <ul style="list-style-type: none"> <li>- <b>Poultry:</b> coccidiosis.</li> </ul>			
Roxarsone (vet only)	AVI, SUI	<ul style="list-style-type: none"> <li>- <b>Swine:</b> gastrointestinal infections</li> </ul> <p>Note: Arsenicals have been withdrawn from the market in some countries/regions due to the detection of tissue residues containing inorganic arsenic, a carcinogen.</p> <p><b>This class is currently only used in animals.</b></p>			X
<b>BICYCLOMYCIN</b>					
Bicozamycin (synonym: bicyclomycin)	SUI	<p>Bicyclomycin are used in:</p> <ul style="list-style-type: none"> <li>- <b>Fish:</b> septicaemia.</li> <li>- <b>Swine:</b> Gastrointestinal and systemic infections caused by Gram negative bacteria.</li> </ul>			X
<b>CEPHALOSPORINS</b>					
<b>CEPHALOSPORINS FIRST GENERATION</b>					
Cefacetrile (synonyms: cephacetrile, cefacertril, cephacertril)	BOV	<p>First and second generation cephalosporins are used in the treatment of septicaemias, respiratory infections, and mastitis in food-producing animals.</p>			
Cefalexin (synonyms: cephalixin, cephacillin, cephalixine, cefalexine)	AVI, BOV, CAN, CAP, EQU, FEL, OVI, SUI	<p>First and second generation cephalosporins are used in:</p> <ul style="list-style-type: none"> <li>- <b>Bovine animals:</b> mastitis (topical use);</li> <li>- <b>Cats and dogs:</b> skin, respiratory and urinary tract infections.</li> </ul>		X	
Cefalonium (vet only) (synonyms: cephalonium, cefalonum)	BOV, CAN, CAP, OVI				
Cefalotin	BOV, CAN, EQU				

Antimicrobial Agents (Class, Subclass and Substance by International Nonproprietary Name [INN])	Species	Specific comments	VCIA	VHIA	VIA
Cefapirin (synonyms: cephapirin, cefapyrin)	BOV	- <b>Poultry</b> : gastrointestinal, respiratory, skin and systemic infections			
Cefazolin (synonyms: cephalazolin, cephazoline, cephalolidin)	BOV, CAP, OVI, SUI				
<b>CEPHALOSPORINS SECOND GENERATION</b>					
Cefuroxime	BOV				
<b>CEPHALOSPORINS THIRD GENERATION</b>		Third and fourth generation cephalosporins are classified as HPCIA's for human health and subject to specific <b>recommendations</b> .  Third and fourth generation cephalosporins are used in:  - <b>Bovine animals</b> : metritis; respiratory infections; septicaemia in calves; mastitis (topical use).  - <b>Cats and dogs</b> : skin, soft tissue, and urinary infections;  - <b>Swine</b> : gastrointestinal and respiratory infections.	X		
Cefixime	CAN, FEL				
Cefoperazone	BOV, CAP, OVI				
Cefovecin (vet only)	CAN, FEL				
Cefpodoxime	CAN				
Ceftiofur (vet only)	AVI, BOV, CAN, CAP, EQU, LEP, OVI, SUI				
Ceftriaxone	BOV, CAN, OVI, SUI				
<b>CEPHALOSPORINS FOURTH GENERATION</b>					
Cefquinome (vet only)	BOV, CAP, EQU, LEP, OVI, SUI				
<b>FUSIDANE</b>					
Fusidic acid	CAN, EQU, FEL				
<b>IONOPHORES</b>		Ionophores are used in:  <b>Poultry</b> : coccidiosis , necrotic enteritis.  <b>This class is currently only used in animals.</b>			X
Lasalocid (vet only)	AVI, BOV, LEP, OVI				
Maduramycin (vet only)	AVI				
Monensin (vet only)	API, AVI, BOV, CAP				
Narasin (vet only)	AVI				
Salinomycin (vet only)	AVI, LEP				

Antimicrobial Agents (Class, Subclass and Substance by International Nonproprietary Name [INN])	Species	Specific comments	VCIA	VHIA	VIA
Semduramicin (vet only)	AVI				
<b>LINCOSAMIDES</b>		Lincosamides are used in:			
Clindamycin	CAN, FEL	- <b>Bovine animals</b> : pyelonephritis, enterotoxaemia; tetanus; mastitis.			
Lincomycin	API, AVI, BOV, CAN, CAP, FEL, OVI, PIS, SUI	- <b>Cats and dogs</b> : bone, dental and skin infections; infections caused by anaerobic bacteria; infections of the central nervous system.			
Pirlimycin (vet only)	BOV	- <b>Fish</b> : infections caused by <i>Streptococcus</i> spp. and <i>Lactococcus</i> spp. - <b>Poultry</b> : colibacillosis, fowl cholera. - <b>Swine</b> : infections caused by Gram positive and anaerobic bacteria.		X	
<b>MACROLIDES</b>		The wide range of applications and the nature of the diseases treated make macrolides extremely important for veterinary medicine, when there are few economical alternatives available.			
<b>MACROLIDES 14-MEMBERED RING</b>		Macrolides are used in:			
Erythromycin	API, AVI, BOV, CAN, CAP, EQU, FEL, LEP, OVI, PIS, SUI	- <b>Bovine animals</b> : ophthalmic and respiratory infections; necrobacillosis in calves; mastitis (topical use).			
Oleandomycin		- <b>Cats and dogs</b> : respiratory and skin infections.			
<b>MACROLIDES 15-MEMBERED RING</b>		- <b>Fish</b> : infections caused by <i>Streptococcus</i> spp., <i>Lactococcus</i> spp., <i>Renibacterium salmoninarum</i> and <i>Francisella</i> spp.			
Azithromycin	CAN	- <b>Poultry</b> : arthritis; gangrenous dermatitis; gastrointestinal and respiratory infections.	X		
Gamithromycin (vet only)	BOV, SUI	- <b>Swine</b> : respiratory infections.			
Tulathromycin (vet only)	BOV, SUI				
<b>MACROLIDES 16-MEMBERED RING</b>					
Carbomycin	AVI				
Josamycin	SUI				
Kitasamycin (vet only)	AVI, PIS, SUI				

Antimicrobial Agents (Class, Subclass and Substance by International Nonproprietary Name [INN])	Species	Specific comments	VCIA	VHIA	VIA
Mirosamicin (synonym: mirosamycin, miporamycin)	API, AVI, SUI				
Spiramycin	AVI, BOV, CAP, EQU, LEP, OVI, SUI				
Tildipirosin (vet only)	BOV, SUI				
Tilmicosin (vet only)	AVI, BOV, CAP, LEP, OVI, PIS, SUI				
Tylosin (vet only)	API, AVI, BOV, CAP, LEP, OVI, SUI				
Tylvalosin (vet only)	AVI, SUI				
<b>MACROLIDES 17- MEMBERED RING</b>					
Sedecamycin (synonym: lankacidin A)					
Terdecamycin					
<b>ORTHOSOMYCINS</b>		Avilamycin is used in:			
Avilamycin (vet only)	AVI, LEP, SUI	- <b>Poultry</b> : necrotic enteritis, gangrenous dermatitis.  - <b>Swine</b> : colibacillosis  <b>This class is currently only used in animals.</b>			X

Antimicrobial Agents (Class, Subclass and Substance by International Nonproprietary Name [INN])	Species	Specific comments	VCIA	VHIA	VIA
<b>PENICILLINS</b>					
<b>NATURAL PENICILLINS (including esters and salts)</b>					
Benethamine penicillin					
Benzylpenicillin (synonyms: penicillin G, benzylpenicillin G, benzopenicillin, benzyl penicillin)	AVI, BOV, CAM, CAN, CAP, EQU, FEL, LEP, OVI, SUI	The wide range of applications and the nature of the diseases treated make penicillins extremely important for veterinary medicine when there are few economical alternatives available.			
Procaine benzylpenicillin (synonyms: benzylpenicillin procaine, procaine G penicillin)	BOV, CAM, CAN, CAP, EQU, FEL, OVI, SUI				
Benzathine benzylpenicillin (synonyms: benzathine penicillin, benzathine penicillin G)		Penicillins are used for:			
Penethamate (vet only) (hydroiodide)	BOV, CAN, SUI	- <b>Bovine animals:</b> arthritis; gastrointestinal, ophthalmic, respiratory, skin, urogenital infections; mastitis (topical use); peritonitis; pododermatitis; septicaemia; tetanus; omphalophlebitis and joint-ill infections in calves.			
Tobicillin					
<b>AMDINOPENICILLINS</b>			X		
Mecillinam (synonyms: amdinocillin, hexacillin, penicillin HX)		- <b>Cats and dogs:</b> gastrointestinal, skin, respiratory infections and urinary infections.			
<b>AMINOPENICILLINS</b>					
Amoxicillin (synonym: amoxycillin)	AVI, BOV, CAN, CAP, EQU, FEL, OVI, PIS, SUI	- <b>Fish:</b> infections caused by <i>Aeromonas</i> spp., <i>Photobacterium</i> spp., and <i>Streptococcus</i> spp.			
Ampicillin	AVI, BOV, CAN, CAP, EQU, FEL, OVI, PIS, SUI	- <b>Poultry:</b> botulism; gastrointestinal, respiratory infections and systemic infections.			
Hetacillin (synonym: phenazacillin)	BOV				
<b>AMINOPENICILLIN + BETALACTAMASE INHIBITOR</b>					
Amoxicillin + Clavulanic Acid	AVI, BOV, CAN, CAP, EQU, FEL, OVI, SUI	- <b>Swine:</b> arthritis; cardiovascular, gastrointestinal, respiratory and systemic infections.			
Ampicillin + Sulbactam	BOV				
<b>CARBOXYPENICILLINS</b>					
Ticarcillin	EQU				
<b>PHENOXYPENICILLINS</b>					

<b>Antimicrobial Agents (Class, Subclass and Substance by International Nonproprietary Name [INN])</b>	<b>Species</b>	<b>Specific comments</b>	<b>VCIA</b>	<b>VHIA</b>	<b>VIA</b>
Phenethicillin (synonyms: phenethicillin, penicillin B)	EQU				
Phenoxymethylpenicillin (synonyms: penicillin V, pen V, penicillin phenoxymethyl, phenoxymethyl penicillin, beromycin, oraxillin)	AVI, CAN, SUI				
<b>ANTISTAPHYLOCOCCAL PENICILLINS</b>					
Cloxacillin (synonym: methocillin S)	BOV, CAN, CAP, EQU, FEL, OVI				
Dicloxacillin (synonym: dicloxacycline)	BOV, CAP, EQU, OVI				
Nafcillin (synonym: naphcillin)	CAP, OVI				
Oxacillin (synonyms: oxazocillin, MPI-penicillin)	BOV, CAP, EQU, OVI				
<b>ANTIPSEUDOMONAL PENICILLINS</b>					
Aspoxicillin					

Antimicrobial Agents (Class, Subclass and Substance by International Nonproprietary Name [INN])	Species	Specific comments	VCIA	VHIA	VIA
<b>PHOSPHONIC ACID DERIVATIVES</b>		Phosphonic acid derivatives are classified as HPCIA for human health and subject to specific <a href="#">recommendations</a> .			
Fosfomycin (synonyms: phosphomycin, phosphonomycin)	AVI, BOV, PIS, SUI	Fosfomycin is used in:  - <a href="#">Bovine animals</a> : gastrointestinal and systemic infections.  - <a href="#">Fish</a> : infections caused by <i>Photobacterium damsela</i> and <i>Edwardsiella</i> spp. (marine fish), and infections with <i>Streptococcus iniae</i> (tilapia).  - <a href="#">Poultry</a> : gastrointestinal infections.  - <a href="#">Swine</a> : gastrointestinal, nervous central system, respiratory and systemic infections.		X	
<b>PLEUROMUTILINS</b>		Pleuromutilins are used in:			
Tiamulin (vet only) (synonym: thiamutilin)	AVI, CAP, LEP, OVI, PIS, SUI	- <a href="#">Fish</a> : infections with <i>Tenacibaculum dicentrarchi</i> (salmon).		X	
Valnemulin (vet only)	SUI	- <a href="#">Poultry</a> : enteric infections.  - <a href="#">Swine</a> : gastrointestinal, nervous central system and systemic infections.			
<b>POLYPEPTIDES</b>		Polypeptides are used in:			
<b>CYCLIC POLYPEPTIDES</b>		- <a href="#">Poultry</a> : gastrointestinal infections.			
Bacitracin	AVI, BOV, CAN, FEL, LEP, OVI, SUI	- <a href="#">Swine</a> : gastrointestinal infections.		X	
Enramycin	AVI, SUI				
Gramicidin	EQU				



Antimicrobial Agents (Class, Subclass and Substance by International Nonproprietary Name [INN])	Species	Specific comments	VCIA	VHIA	VIA
<b>POLYMYXINS</b>		- <b>Cats and dogs</b> : ophthalmic and skin infections; otitis.			
Polymyxin B (synonym: polymixin B)	CAN, CAP, EQU, FEL, LEP, OVI, SUI	Colistin is classified as a HPCIA for human health and subject to specific <b>recommendations</b> .			
Colistin (synonym: polymyxin E)	AVI, BOV, CAN, CAP, EQU, FEL, LEP, OVI, SUI	Polymyxin E (colistin) is used in:  - <b>Bovine animals</b> : gastrointestinal infections.  - <b>Cats and dogs</b> : otitis (topical use).  - <b>Poultry</b> : colibacillosis.  - <b>Swine</b> : gastrointestinal infections.  Polymyxin B is used in:  - <b>Cats and dogs</b> : skin infections and otitis (topical use).			
<b>QUINOLONES</b>					
<b>QUINOLONES 1ST GENERATION</b>		Quinolones of the 1st generations are used in the treatment of septicaemias and infections such as colibacillosis in food-producing animals.			
Flumequine (synonym: flumequin)	AVI, BOV, CAN, CAP, EQU, FEL, LEP, OVI, PIS, SUI	Quinolones of the 1st generation are used in:			
Miloxacin					
Nalidixic acid (synonyms: nalixidate, nalidixinic acid, nalidic acid)		- <b>Bovine animals</b> : gastrointestinal and respiratory infections.  - <b>Cats and dogs</b> : gastrointestinal, skin, respiratory and urinary tract infections.		X	
Oxolinic acid	AVI, BOV, LEP, OVI, PIS, SUI	- <b>Crustaceans and fish</b> : wide variety of bacterial infections  - <b>Poultry</b> : colibacillosis; respiratory infections; fowl cholera.  - <b>Swine</b> : respiratory infections.			
<b>QUINOLONES 2ND GENERATION (FLUOROQUINOLONES)</b>		Fluoroquinolones are classified as a HPCIA for human health and subject to specific <b>recommendations</b> .			
Ciprofloxacin	AVI, BOV, PIS, SUI		X		
Danofloxacin (vet only)	BOV, CAP, LEP, OVI, SUI	The wide range of applications and the nature of the diseases treated make fluoroquinolones			
Difloxacin	AVI, LEP, SUI				

Antimicrobial Agents (Class, Subclass and Substance by International Nonproprietary Name [INN])	Species	Specific comments	VCIA	VHIA	VIA
Enrofloxacin (vet only)	AVI, BOV, CAN, CAP, CRU, EQU, FEL, LEP, OVI, PIS, SUI	extremely important for veterinary medicine.			
Ibafloxacin	CAN, FEL	- <b>Bovine animals:</b> arthritis; gastrointestinal, respiratory and urogenital system infections; septicaemia; mastitis (topical).			
Levofloxacin	CAN				
Marbofloxacin (vet only)	BOV, CAN, EQU, FEL, LEP, SUI	- <b>Cats and dogs:</b> gastrointestinal, nervous central system, respiratory, skin, soft tissues and urogenital infections; otitis (topical).			
Norfloxacin	AVI, BOV, CAN, CAP, FEL, LEP, OVI, SUI				
Ofloxacin	AVI, CAN, FEL, SUI	- <b>Crustaceans and fish:</b> wide variety of bacterial infections.			
Orbifloxacin (vet only)	BOV, CAN, FEL, SUI	- <b>Poultry:</b> gastrointestinal, respiratory and systemic infections.			
Pradofloxacin (vet only)	BOV, CAN, FEL				
Sarafloxacin		- <b>Swine:</b> arthritis; cardiovascular, central nervous system, gastrointestinal, respiratory and systemic infections.			
<b>QUINOXALINES</b>		Carbadox is used in:			
Carbadox (vet only)	SUI	- <b>Swine:</b> gastrointestinal infections			
Olaquinox (vet only) (synonym: olachinox)		<b>This class is currently only used in animals.</b>  Note: Carbadox has been withdrawn from the market in some countries/regions due to the detection of carcinogenic tissue residues.			X

Antimicrobial Agents (Class, Subclass and Substance by International Nonproprietary Name [INN])	Species	Specific comments	VCIA	VHIA	VIA
<b>SULFONAMIDES</b>					
Phthalylsulfathiazole (vet only) (synonyms: sulfathalidine, phthalazol, phthalylsulphathiazole, phthalylsulfonazole)	CAN, FEL, SUI				
Sulfacetamide (synonyms: sulphacetamide, acetosulfamine, acetosulfamin, N- acetylsulfanilamide)	AVI, BOV, CAN, FEL, OVI, SUI				
Sulfachlorpyridazine (synonym: sulfachloropyridazine)	AVI, BOV, SUI				
Sulfadiazine (synonyms: sulphadiazine, sulfapyrimidine, sulfadiazin, sulfazine, sulfadiazene)	AVI, BOV, CAN, CAP, FEL, OVI, PIS, SUI				
Sulfamethoxazole (synonyms: sulfadimethoxazole sulphamethoxazole, sulfisomezole)	AVI, BOV, CAN, FEL, SUI				
Sulfadimethoxine (synonyms: sulphadimethoxine, sulfadimethoxin, sulfadimethoxydiazine)	AVI, BOV, CAN, CAP, EQU, FEL, LEP, OVI, PIS, SUI				
Sulfadimidine (synonyms: sulfamethazine, sulfadimethyldiazine, sulfamezathine, sulphamethazine, sulfadimerazine)	AVI, BOV, CAN, CAP, EQU, FEL, LEP, OVI, SUI				
Sulfadoxine (synonyms: sulphadoxine, sulforthomidine, sulphormethoxine, sulfadoxin)	AVI, BOV, CAN, EQU, FEL, OVI, SUI				
Sulfafurazole (synonyms: sulfisoxazole, sulphafurazole, sulfisoxazol, sulfafurazol)	CAN, PIS				
		<p>Sulfonamides extremely important for veterinary medicine as they are critically important in the treatment of a wide range of bacterial and protozoal infections in a wide range of animal species when few economic alternatives are available.</p> <p>Sulfonamides are used in:</p> <ul style="list-style-type: none"> <li>- <b>Bovine animals:</b> gastrointestinal, respiratory, skin (including pododermatitis), soft tissue, infections; sepsis; mastitis (topical).</li> <li>- <b>Cats and dogs:</b> gastrointestinal, respiratory, skin, urinary infections; septicaemia.</li> <li>- <b>Poultry:</b> wide variety of bacterial and coccidia infections.</li> <li>- <b>Swine:</b> cardiovascular, central nervous system, gastrointestinal, respiratory and systemic infections.</li> </ul>	X		

Antimicrobial Agents (Class, Subclass and Substance by International Nonproprietary Name [INN])	Species	Specific comments	VCIA	VHIA	VIA
Sulfaguanidine (synonyms: sulfaguanidin, sulphaguanidine, sulfanilguanidine, sulfoguanidine)	AVI, CAN, CAP, FEL, OVI, SUI				
Sulfamerazine (synonyms: sulphamerazine, sulfamerazin, sulfamethyldiazine)	AVI, BOV, CAN, CAP, EQU, FEL, LEP, OVI, PIS, SUI				
Sulfamethoxydiazine (synonyms: sulfamethoxine, sulfameter, sulfamethoxydiazine, sulfamethoxypyrimidine)	AVI				
Sulfamonomethoxine (synonyms: sulfamonomethoxin, sulfamonmethoxine)	AVI, BOV, CAN, FEL, PIS, SUI				
Sulfanilamide (synonyms: sulphanilamide, sulfamine, sulfonilamide)	BOV, CAN, CAP, FEL, OVI, SUI				
Sulfapyridine (synonym: sulphapyridine)	BOV, CAN, FEL, SUI				
Sulfaquinoxaline (synonyms: sulfabenzpyrazine, sulphaquinoxaline)	AVI, BOV, CAP, LEP, OVI, SUI				
Sulfamethoxypyridazine (synonyms: sulphamethoxypyridazine, sulfapyridazine, sulfametoxipiridazine)	AVI, BOV, CAN, EQU, FEL, SUI				
<b>SULFONAMIDES+ DIAMINOPYRIMIDINES</b>					
Ormetoprim (synonyms: ormethoprim, ormetoprim) + sulfonamide	AVI, BOV, PIS, SUI				
Trimethoprim (synonym: trimetoprim) + sulfonamide	AVI, BOV, CAN, CAP, EQU, FEL, LEP, OVI, PIS, SUI				
<b>DIAMINOPYRIMIDINES</b>					
Baquiloprim					

Antimicrobial Agents (Class, Subclass and Substance by International Nonproprietary Name [INN])	Species	Specific comments	VCIA	VHIA	VIA
Ormetoprim (synonyms: ormethoprim, ormetoprim)	AVI				
Trimethoprim (synonym: trimetoprim)	AVI, BOV, CAP, EQU, LEP, OVI				
<b>STREPTOGRAMINS</b>					
Virginiamycin (vet only) (synonym: pristinamycin)	AVI, BOV, OVI, SUI	Streptogramins are used in: - <b>Bovine animals</b> : liver abscesses - <b>Poultry</b> : necrotic enteritis.			X
<b>TETRACYCLINES</b>					
Chlortetracycline	AVI, BOV, CAN, CAP, EQU, FEL, LEP, OVI, PIS, SUI	The wide range of applications and the nature of the diseases treated make tetracyclines extremely important for veterinary medicine when few economical alternatives are available.			
Doxycycline (synonyms: doxytetracycline, doxycyclin)	AVI, BOV, CAM, CAN, CAP, EQU, FEL, LEP, OVI, PIS, SUI	Tetracyclines are used in: - <b>Bovine animals</b> : arthritis; navel- ill (calves); ophthalmic, gastrointestinal, respiratory and genital infections; pododermatitis; septicaemia; ophthalmic infections, traumatic or surgical wounds (topical use).			
Oxytetracycline (synonyms: oxytetracycline, oxytetracyclin, oxitetracyclin, oxytetracycline)	API, AVI, BOV, CAM, CAN, CAP, CRU, EQU, FEL, LEP, OVI, PIS, SUI				
Tetracycline (synonym: tetracyclin)	API, AVI, BOV, CAM, CAN, CAP, EQU, FEL, LEP, OVI, PIS, SUI	- <b>Cats and dogs</b> : respiratory and skin infections; tick-borne diseases; superficial skin and ophthalmic infections (topical use). - <b>Crustaceans and fish</b> : wide range of bacterial diseases - <b>Poultry</b> : bacterial and coccidial infections. - <b>Swine</b> : arthritis; cardiovascular, central nervous system, respiratory and systemic infections.	X		
<b>THIOSTREPTON</b>					
Nosiheptide	BOV	Thiopeptides are used in: - <b>Bovine animals</b> : systemic infections caused by Gram positive bacteria.			
Thiostrepton	CAN, FEL	- <b>Cats and dogs</b> : otitis and skin infections (topical use)			X
<b>HALOGENATE HYDROXYQUINOLINES</b>					

Antimicrobial Agents (Class, Subclass and Substance by International Nonproprietary Name [INN])	Species	Specific comments	VCIA	VHIA	VIA
Halquinol	SUI	Halogenate hydroxyquinolines are used in: - <b>Swine</b> : gastrointestinal and systemic infections caused by Gram negative bacteria.			
<b>PSEUDOMONIC ACID</b>					
Mupirocin	CAN, FEL	Pseudomonic acids are used in: - <b>Cats and dogs</b> : skin infections (topical use).			
<b>NITROIMIDAZOLES</b>					
Metronidazole	CAN, FEL	Nitroimidazoles are used in: - <b>Cats and dogs</b> : gastrointestinal infections.			
Ornidazole	CAN				
Tinidazole	CAN, FEL				