

Product	Species	Indication	Current SPC	Category of deviation	Suggested SPC deviation	References
Kanamycin, Cefalexin (e.g. Ubrolixin)	Cattle	Intramammary treatment of bacterial mastitis	The SPC authorises a treatment duration of 2 days using intramammary administration.	Duration	Clinical experience and published data indicate that mastitis caused by bacteria susceptible to kanamycin and cefalexin often requires at least 3–4 days of treatment to achieve effective bacteriological cure. The SPC-defined duration may result in incomplete resolution and persistence of infection.	Scientific literature on intramammary therapy supports longer treatment durations to ensure adequate antimicrobial exposure within the mammary gland, particularly in moderate to severe cases of mastitis
Aminopenicillins	Horses	Infections caused by micro-organisms sensitive to aminopenicillins	Ampicilline trihydrate - IM 20mg/kg BID Ampicilline sodique IV IM 20 Mg/kg 3 or 4times/day Amoxicilline sodique IV IM 10 -30 mg/kg 3 times a day Amoxicilline trihydrate 13-30 mg/kg 3 times a day (foal)	Administration	oral administration possible for young foals, prohibited for adult horses	https://pmc.ncbi.nlm.nih.gov/articles/PMC11176610/
Amoxicillin	Dog/Cat	Soft tissue infections (pyoderma, wound infections, abscesses), urinary tract infections, gastrointestinal infections, respiratory infections	SPC: 10 mg/kg every 12 hours	Dosage	Evidence-based dosage: 10–20 mg/kg every 12 hours. In practice, higher doses and shorter intervals (20 mg/kg every 8 hours) are required for optimal efficacy in soft tissue infections.	Amoxicillin is a time-dependent antibiotic with a short half-life (1-2 hours in dogs). With 10 mg/kg q12h, concentrations fall below MIC too quickly. Rising MIC values for <i>Staphylococcus pseudintermedius</i> further necessitate more frequent dosing.
Amoxicillin	Pigs	Bacterial infections caused by Gram-positive and Gram-negative organisms	Although the pharmacological spectrum of amoxicillin is broad, many authorised veterinary products include highly restricted or inconsistent indications depending on formulation and route of administration, despite identical composition and dosage. In practice, this leads to situations where clinically relevant pathogens (e.g. <i>Staphylococcus hyicus</i> , <i>Staphylococcus aureus</i> , <i>Clostridium perfringens</i>) are not explicitly covered in the SPC, particularly for products administered via drinking water, necessitating deviation from authorised indications to ensure appropriate treatment aligned with microbiological evidence and clinical guidelines.	Indication (Cascade)		
Amoxicillin/clavulanic acid (e.g. Synolox)	Dog/Cat	Common bacterial infections (skin and soft tissue infections, urinary tract infections, respiratory infections)	According to the SPC, amoxicillin/clavulanic acid is usually authorised at a dosage of 10 mg amoxicillin / 2.5 mg clavulanic acid per kg twice a day, usually with fixed treatment durations of 5–7 days	Dosage	In daily small animal practice, the authorised SPC dosage is frequently insufficient e.g. for deep, complicated or recurrent infections, such as deep pyoderma or certain urinary tract infections, to ensure adequate clinical efficacy, particularly in moderate to severe infections. Higher dosages and/or shorter dosing intervals (e.g. 20-25 mg/kg q8-12) are commonly required to achieve appropriate antimicrobial exposure. In clinical practice, treatment is often continued until full clinical resolution, with reassessment and management of underlying predisposing factors. Optimisation of dosing intervals within accepted pharmacological ranges, rather than simple dose escalation, may be required to ensure adequate exposure and therapeutic success.	The BSAVA Small Animal Formulary (11th Edition) reports a usual dosage range of 12.5–25 mg/kg administered every 8–12 hours orally. These recommendations are widely applied in practice and are based on accumulated clinical experience and pharmacokinetic/pharmacodynamic principles. ISCAID UTI Guidelines, 2019. ISCAID Dermatology Guidelines, 2014. AAVPT (American Academy of Veterinary Pharmacology and Therapeutics) monograph on amoxicillin/clavulanic acid. CLSI breakpoints 2024 now indicate that all Enterobacterales cultured from samples outside the urinary tract should be considered RESISTANT to amoxiclav. This is (likely at least in part) because these breakpoints are calculated at this SPC dose. Our clinical experience suggests that we achieve good clinical outcomes with higher doses (prospective study ongoing). Amoxiclav is still recommended (at higher doses) in most guidelines (PROTECT ME).

Amoxicillin trihydrate	Cattle/Pigs	Respiratory	Amoxicillin (trihydraat): 150 mg/ml, Bovines: 15 mg/kg (repeat after 48 h) Pig: 15 mg/kg pd (repeat after 24 h) Piglet: 15 mg/kg pd (3 d)	Duration	For pneumonia, BRD in cattle, need to go up to 10 days when necessary (5 injections). Indications are too limited, would be good to extend indications to other bacteria sensitive to amoxicillin trihydrate.	
Ampicillin (ampicillin sodium injectable products)	Cattle/Calves	Bacterial infections caused by Gram-positive and Gram-negative bacteria	Different authorised veterinary medicinal products containing ampicillin sodium indicate divergent dosage regimens for the same species and indication. SPCs report dosages ranging from 2 to 10 ml/100 kg body weight, with administration either once daily or twice daily at 12-hour intervals.	Dosage	The presence of multiple authorised SPCs with markedly different dosing regimens for the same active substance and indication creates uncertainty in clinical practice. Fixed adherence to one SPC may result in underdosing or unnecessarily complex treatment schedules, depending on the product selected	Clinical practice and PK/PD principles support harmonised dosing strategies based on the active substance rather than on product-specific SPC variability. The observed discrepancies are not justified by differences in formulation or clinical evidence
Benzylpenicillin procaine e.g. Propen 300 mg/ml suspension for injection for cattle, sheep and pigs.	Cattle/Calves	Listeriose in cattle, respiratory diseases in cattle	The recommended dose is 8 ml per 100 kg bodyweight i.e. 24 mg procaine penicillin per kg bodyweight. To ensure a correct dosage, body weight should be determined as accurately as possible. For intramuscular administration only. The dose should be given once daily. The treatment duration is 3 to 7 days.	Dosage	For listeriose: A minimum dose of 44,000 iu/kg procaine penicillin injected intramuscularly q24h for at least 10 days must be considered in addition to 44,000 iu/kg penicillin G injected intravenously on the first day. Dose rates as high as 300,000 iu/kg have been recommended for the first day of antibiotic therapy because it is essential to exceed the MIC by 10–30 times in order to achieve a successful outcome. The internationally recommended intramuscular treatment in listerial encephalitis in cattle is double the SPC dose, and also exceeds the SPC stated duration. For respiratory diseases, longer durations are sometimes needed, especially for chronic pneumonia	Scott, P. R., Penny, C. D., & Macrae, A. I. (2011). Cattle medicine (1st ed.). Manson/Veterinary Press. https://doi.org/10.1201/b15179
Benzylpenicillin prodrugs e.g. penethamate (hydriodide)	Horses	ed by micro-organisms sensitive to	IM. Day 1: 7.72 g SID , Day 2 & 3: 3.86 g of penethamate per horse each day.	Duration	IM. Day 1: 7.72-15.4 mg/kg SID or BID, Day 2 & 3: 3.86 g of penethamate per horse each day. Extension might be necessary to 5-8 days	https://pmc.ncbi.nlm.nih.gov/articles/PMC11176610/
Benzylpenicillin sodium for IV	Horses	Infections caused by micro-organisms sensitive to benzylpenicillin in hors	10-20 mg/kg body weight intravenously (slowly), equivalent of 3.3 – 6.7 ml/100 kg body weight, 2 times a day. The treatment should last a minimum of 4 days.	Dosage	The scientific literature recommends 10mg/kg q6h	https://www.sciencedirect.com/science/article/abs/pii/S007193595801294 https://pmc.ncbi.nlm.nih.gov/articles/PMC11176610/
Cefazolin	Dog/Cat	Perioperative prophylaxis and bone infections.	SPC: 22 mg/kg every 12 hours	Dosage	Evidence-based dosage: 30 mg/kg every 12 hours	
Cephalexin	Dog/Cat	Treatment of infections of the respiratory system, urogenital system, and skin, localized soft tissue infections, and gastrointestinal infections caused by bacteria sensitive to cephalexin.	SPC: 15 mg/kg every 12 hours.	Dosage	Evidence-based dosage: 30 mg/kg every 12 hours.	Deep pyoderma, osteomyelitis and orthopaedic surgery require higher tissue concentrations to reach PK/PD targets.
Cephalexin (natrium)	Cattle	Respiratory	Bovo,e: 7 mg/kg pd (5 d)	Duration	Longer treatment may be necessary for acute or chronic pneumonia.	
Cephalosporins (ceftiofur, cefazolin, cefquinome)	Horses	Susceptible infections	E.g. Ceftiofur IM 2,2 mg / kg SID for 10 days	Dosage	Ceftiofur IV 2,2 mg/Kg BID in adults, 5-10 mg/kg BID to QID in foals, for 5-10 days Cefquinome IV-IM: 1.2 mg/kg BID	SPC regimens frequently fail to achieve AUC/MIC targets, particularly in severe infections and in foals. In foals, marked differences in volume of distribution and clearance invalidate adult-based SPC dosages and require specific adaptations.
Chlortetracycline (e.g. Chloromed)	Pigs	Respiratory diseases	20g/150 kg daily for 7 days	Duration	IN DK, very good effect even with shorter treatment (3-5 days)	

Clindamycin (e.g. Antirobe,Zodon, Clinacin)	Dog/Cat	Osteomyelitis, deep abscesses, periodontal and bone infections.	SPC: 5.5 mg/kg every 12 hours	Dosage	Evidence-based dosage: 10-12 mg/kg every 12 hours. Duration 14-28 days. Missing indication for toxoplasmosis. In some cases, for toxoplasmosis dosages needs to be higher (e.g. 10-25 mg/kg), sometimes for longer durations.	ABCD Toxoplasmosis guidelines
Dicloxacillin / Ampicillin combinations, injectable (e.g. Cloxalene Plus)	Cattle/Calves	Bacterial infections caused by Gram-positive and Gram-negative bacteria	SPC prescribes a treatment once a day, for up to 3 days.	Duration	More than three treatments may be required to achieve clinical efficacy (usually, five days of treatment).	Clinical experience and AMS principles. Scientific literature and clinical practice indicate that effective treatment of mastitis and systemic infections caused by susceptible pathogens requires a minimum treatment duration of 5–7 days. The SPC-authorised duration is frequently insufficient to ensure complete clinical and bacteriological resolution. Multiple scientific publications and field studies demonstrate that beta-lactam antibiotics, such as ampicillin and dicloxacillin, are time-dependent antimicrobials and require prolonged exposure above the MIC to achieve therapeutic success. These principles are not adequately reflected in the SPC-authorised treatment duration
Doxycycline	Pigs	Respiratory diseases	Authorised products vary considerably in their listed indications and dosing and duration.	Dosage	Field experience and clinical observation indicate that higher doses than those commonly authorised are often required to achieve adequate clinical efficacy. Only a limited number of products recommend 20 mg/kg body weight for five consecutive days (Altidox 500 and Powdox 500 mg), which aligns with practitioner experience and suggests that authorised dosing regimens may be suboptimal for consistent therapeutic success.	Pierre-louis Toutain, Alain Bousquet-melou, Aude A Ferran, Béatrice B Roques, Jérôme R E del Castillo, et al.. Pharmacokinetic–Pharmacodynamic Cutoff Values for Doxycycline in Pigs to Support the Establishment of Clinical Breakpoints for Antimicrobial Susceptibility Testing. Journal of Veterinary Pharmacology and Therapeutics, 2025, ff10.1111/jvp.13511ff. ffhal-05046560f
Doxycycline (e.g. Ronaxan, Doxybactin, Doxycare, Cepedox Vet)	Cat	Susceptible infections	Many doxycycline SPCs focus on “susceptible infections” with typical 5–7 day courses, extendable to 14 days in chronic/resistant cases, and may include specific longer courses such as Chlamydia felis (minimum 28 days).	Duration	For haemoplasmas, guidance typically recommends longer courses (commonly 2–4 weeks), and for respiratory Mycoplasma, doxycycline is a first-line option with evidence that 14 days can be superior to 7 days for microbiological clearance in M. felis. There are other clinical scenarios where guidelines prioritize doxycycline missing in the indications	ABCD guideline on haemoplasmosis: 2–4 weeks commonly discussed. ISCAID respiratory antimicrobial guidelines (Lappin et al. 2017) and referenced RCT comparing 7 vs 14 days in M. felis. ABCD guideline on feline respiratory Mycoplasma infections: doxycycline as a good first choice with suggested dosing.
Enrofloxacin	Dog	Bacterial infections caused by Gram-negative and mixed pathogens	European SPCs vary in dosing. Is generally a fixed dosage of 2 mg/kg or 5 mg/kg orally once daily.	Dosage	In canine clinical practice, a fixed dosage of 5 mg/kg may be insufficient to reach therapeutic targets in infections caused by pathogens with higher MIC values. A flexible dosing approach based on infection severity and bacterial susceptibility is often required. Evidence-based dosage: 10–20 mg/kg/day in severe infections.	In some countries, enrofloxacin is authorised for dogs at a dosage range of 5–20 mg/kg once daily. This flexible dosing range is supported by MIC interpretation and PK/PD data and is commonly applied in clinical practice. CLSI has also issues new clinical breakpoint categories (SDD or susceptible dose dependent) that are tied to higher doses of fluoroquinolones. The higher doses enrofloxacin are included in the PROTECT ME poster, ISCAID guidelines for urinary tract disease (Weese JS, Blondeau J, Boothe D, Guardabassi LG, Gumley N, Papich M, Jessen LR, Lappin M, Rankin S, Westropp JL, Sykes J. International Society for Companion Animal Infectious Diseases (ISCAID) guidelines for the diagnosis and management of bacterial urinary tract infections in dogs and cats. Vet J. 2019 May;247:8-25. doi: 10.1016/j.tvjl.2019.02.008. Epub 2019 Feb 26) and the FirstLine app. https://www.sciencedirect.com/science/article/pii/S109002331830460X?

Florfenicol products (e.g. Florkem, Norfenicol, Selectan – injectables)	Cattle/Pigs	Cattle: Treatment of respiratory tract infections (BRD) - Pigs - acute respiratory disease	Registered for two injections 48 hours apart in cattle. Bo (im): 20 mg/kg (2 x met 48 h interval) Bo (sc): 40 mg/kg (1 x) Ov (lt > 7 w): 20 mg/kg pd (im) (3 d) Preventie: Bo (sc): 40 mg/kg (1 x)	Duration	More than two treatments may be required to achieve clinical efficacy in cases of pneumonia, while in other situations a single treatment may be sufficient. When detected based on clinical signs, 2 days or even 4 days are not sufficient. 6 to 8 days are needed, and in worse cases even much much longer. This is an economic and welfare issue.	Scientific literature and PK/PD-based approaches highlight significant variability in disease severity and therapeutic response in bovine respiratory disease, supporting the need for flexible treatment strategies. Catry B, Duchateau L, Van de Ven J, Laevens H, Opsomer G, Haesebrouck F, De Kruijff A. Efficacy of metaphylactic florfenicol therapy during natural outbreaks of bovine respiratory disease. J Vet Pharmacol Ther. 2008 Oct;31(5):479-87. doi: 10.1111/j.1365-2885.2008.00981.x. PMID: 19000268.
Fluoroquinolones e.g. Baytril, Marbocyl	Horses	Infections caused by micro-organisms sensitive to quinolones	Only approved in horses in some countries. Indication missing in some countries	Indication	Enrofloxacin: PO 7.5 mg/kg SID or IV slow together with 500ml NaClO 9%, 5,5mg/kg SID Marbofloxacin 2 mg/kg IV slow or IM SID 8 days	critical antibiotic, should only be used as last resort, reserved for severe infections or when culture & sensitivity show resistance to other drugs.
Gentamicin	Cattle/Calves	Cattle and calves: Severe mastitis (grade 3), neonatal septicaemia/diarrhoea	Not authorised for these indications in some countries. In others: SPC: 3,000 IU/kg every 8 hours.	Dosage	In life-threatening infections, gentamicin would be clinically appropriate based on its rapid bactericidal activity and spectrum. SPC restrictions prevent its use even where scientifically justified, potentially forcing use of critically important antimicrobials or compromising outcomes. For those authorised for 3,000IU/kg per 8 hours, sometimes a higher single daily dose is recommended	Accepted critical-care principles; comparative use in other species. Naranjo-Lucena A, Slowey R. Invited review: Antimicrobial resistance in bovine mastitis pathogens: A review of genetic determinants and prevalence of resistance in European countries. Journal of Dairy Science. 2023;106(1). Gentamicin is concentration-dependent; SPC regimens fail to reach Cmax/MIC targets (>8-10). doi:10.3168/jds.2022-22267.
Gentamicin sulfate e.g. Gentaject 10% Solution for Injection for Horses	Horses	For serious infections where Gram- coverage is necessary. Works primarily against Gram-negative aerobes (e.g., E. coli, Pseudomonas, Klebsiella); limited Gram-positive activity. IV or IM (IM less common due to irritation). Used also for oals with acute abdomen surgery	Single dose of 6.6 mg/kg body weight given intravenously once daily for 3-5 consecutive days	Dosage	Dose adjustment needed for renal impairment or prolonged therapy. Due to different PK/PD in foals, the dosages differ in foals. Foal: 12 mg/kg every 36 h i.v. E.g. the recommended dose of procaine penicillin in a postoperative acute abdomen foal is greater than the SPC, and is four times a day, not once as listed in SPC. Used for other indications for bacteria sensitive to gentamicin sulfate - indications in SPC should be extended Adult horse: 6.5-8 mg/kg IV SID 5 to 10 days Foal less than 2 weeks: 11-15 mg/kg SID	Is a concentration-dependent antibiotic, which is why peak plasma concentration (Cmax) is decisive for its effectiveness against bacterial infections. It is also polar and distributed primarily to extracellular fluids. Gentamicin is most effective when the Cmax:MIC ratio is 8-12:1 (Bauquier et al. 2015., Magdesian 2017). The higher dosage for foals is due, among other things, to the fact that they have a larger amount of water in their bodies than the adult horses. Bauquier et al. 2015. Plasma peak and trough gentamicin concentrations in hospitalized horses receiving intravenously administered gentamicin. J. Vet. Intern. Med. 29, ss. 1660-1666. Gillen, A. (2024). The Acute Abdomen in the Neonatal Foal. In Equine Neonatal Medicine (eds D.M. Wong and P.A. Wilkins). https://doi-org.ucd.idm.oclc.org/10.1002/9781119617228.ch18 Newborn foals have a different pharmacokinetic profile (Burton et al. 2012, Raidal et al., 2013)
Lincomycin	Pigs	Treatment of swine diseases caused by pathogens that are difficult to culture or test for antimicrobial susceptibility, such as <i>Brachyspira hyodysenteriae</i> , <i>Mycoplasma hyopneumoniae</i> and <i>Lawsonia intracellularis</i> .	Authorised oral regimens typically recommend prolonged treatment durations of up to 21 days, with lower doses indicated for swine dysentery than for enzootic pneumonia.	Dosage	Given the challenges associated with confirming susceptibility and the availability of higher-concentration formulations, clinical practice may require dose adjustments beyond those described in the SPC to ensure effective treatment, despite the lack of explicit authorisation.	

Marbofloxacin	Dog/Cat	Urinary tract infections, skin and soft tissue infections e.g. pyelonephritis, prostatitis, and severe pneumonia	European SPCs generally indicate fixed dosages, typically around 2 mg/kg orally once daily.	Dosage	In routine practice, higher dosages(2.5–5 mg/kg/day) than those authorised in European SPCs are frequently required to achieve clinical efficacy, particularly in infections involving less susceptible bacterial strains. Higher doses should be considered for certain sites, including in prostatitis, and for certain isolates of <i>Pseudomonas aeruginosa</i> .	In some countries, marbofloxacin is authorised at dosages ranging from 2.75 to 5.5 mg/kg once daily. In UK formularies, these dosages are described as extra-label, despite being widely used in daily practice based on PK/PD considerations and clinical outcomes. refs: -International Society for Companion Animal Infectious Diseases (ISCAID) guidelines for the diagnosis and management of bacterial urinary tract infections in dogs and cats -Antimicrobial use Guidelines for Treatment of Respiratory Tract Disease in Dogs and Cats: Antimicrobial Guidelines Working Group of the International Society for Companion Animal Infectious Diseases; https://onlinelibrary.wiley.com/doi/10.1111/jvim.14627 -British Small Animal Veterinary Association: Small Animal Formulary – Part A: Canine and Feline; Eleventh edition 2023
Metronidazole	Dog/Cat	Treatment as second line option for certain gastrointestinal infections caused by <i>Giardia</i> spp. and in specific cases for <i>Clostridium</i> spp. (i.e., <i>C. perfringens</i> or <i>C. difficile</i>). Treatment of infections of the urogenital tract, oral cavity, throat, and skin caused by strictly anaerobic bacteria (e.g., <i>Clostridium</i> spp.).	SPC: 25–30 mg/kg every 12 hours or 50 mg/kg pd (5-7 d)	Dosage	Evidence-based dosage: dogs 10–15 mg/kg every 12 hours for 5-7 days; cats 7.5–15 mg/kg every 12 hours for 5-7 days	See ESCCAP, WSAVA, BSAVA and ISCAID guidelines. Metronidazole is not first line, but can be necessary certain cases (e.g. not reacting to fenbendazole). Metronidazole is neurotoxic, so careful dosing is required according to the patient. Tauro A, Beltran E, Cherubini GB, Coelho AT, Wessmann A, Driver CJ, Rusbridge CJ. Metronidazole-induced neurotoxicity in 26 dogs. Aust Vet J. 2018 Dec;96(12):495-501. https://www.abcdcatsvets.org/guideline-for-giardiasis/
Neomycin–procaine penicillin combinations	Cattle/Calves	Septic arthritis, lameness, musculoskeletal and soft-tissue infection	Maximum treatment duration of 3 days	Duration	Deep-seated musculoskeletal infections routinely require longer treatment durations to achieve clinical cure. A 3-day course is frequently insufficient and risks treatment failure, relapse, repeated antimicrobial exposure, and compromised animal welfare	Established infectious disease principles and standard clinical practice in bovine medicine.
Oxytetracycline (injectable formulations)	Cattle/Calves	Respiratory, uterine and systemic bacterial infections	Authorised SPCs for oxytetracycline injectable products report different dosages and administration intervals for the same species and indications, including variations in dose per kg body weight and frequency of administration.	Duration	In daily veterinary practice, rigid adherence to individual SPCs leads to inconsistent treatment approaches for the same clinical condition. Clinicians often rely on established clinical protocols rather than product-specific instructions to ensure effective therapy. For BRD and pneumonia, often longer durations must be used.	Scientific literature and field experience demonstrate that therapeutic efficacy is primarily driven by achieving adequate plasma concentrations of the active substance, supporting harmonisation of dosing regimens across products. E.g.: Oxta MV 10 Registered for a 3-day treatment. Issue: In practice, more days of treatments (about 5 days) may be required to achieve clinical efficacy, especially in cases of phlegmon. Front. Microbiol. 15:1498219. doi: 10.3389/fmicb.2024.1498219
Oxytetracycline and Chlortetracycline	Pigs	Infections caused by Gram-positive and Gram-negative bacteria	Despite sharing the same antimicrobial class, route of administration and similar pharmacological properties, authorised products display substantial variability in dosing regimens and indications.	Indication (Cascade)	Notably, these antibiotics are considered drugs of choice for leptospiral infections according to the scientific literature; however, SPCs commonly contraindicate their use during gestation and lactation, creating a contradiction given that leptospirosis primarily causes reproductive disorders in pigs.	

Panadia® (tetracycline) / Panafuge® (tetracycline/dihydrostreptomycin combination)	Cattle/Calves	Cattle: Foot rot	Fixed bottle volume calibrated for ~500 kg animals	Dosage	Modern dairy and beef cattle commonly weigh 650–700 kg or more. SPC-based dosing therefore results in systematic underdosing, risking reduced efficacy and treatment failure.	Changes in production systems and animal size since SPC approval. Pathogenesis and Treatment of Bovine Foot Rot –Van Metre; Vet Clin Food Anim 33 (2017) 183–194 http://dx.doi.org/10.1016/j.cvfa.2017.02.003 Osova, A., Mihajlovicova, X., Hund, A., Mudron, P., 2017. Interdigital phlegmon (foot rot) in dairy cattle - an update. Wien. Tierarztl. Monatsschr. 104, 209–220. Morck, D.W., Olson, M.E., Louie, T.J., Koppe, A., Quinn, B., 1998. Comparison of ceftiofur sodium and oxytetracycline for treatment of acute interdigital phlegmon (foot rot) in feedlot cattle. J. Am. Vet. Med. Assoc. 212, 254–7. Reinöhl-DeSouza, C., Kofler, J., 2006. Interdigital phlegmon (interdigital necrobacillosis, footrot) in 66 cattle. Part 2: Treatment and outcome. Tierärztliche Prax. Ausgabe G Großtiere / Nutztiere 34, 80–85. https://doi.org/10.1055/s-0037-1621053 Relun, A., Guatteo, R., Fortineau, O., Lutz, C., 2021. Le super panaris : définition, origine et prise en charge. Regards croisés entre données de la littérature et observations du terrain. Bull. des G.T.V. 104, 67–75.
Penethamate	Cattle	Treatment of mastitis caused by Streptococcus uberis, Streptococcus dysgalactiae, Streptococcus agalactiae, and Staphylococcus aureus (strains that do not produce beta-lactamase) that are sensitive to penicillin in milking cows	SPC: once-daily injection.	Dosage	Evidence-based practice: twice-daily injection.	Milk concentrations fall below effective levels after 12 hours due to milking elimination.
Penicillin / Streptomycin combinations	Cattle	Systemic bacterial infections caused by Gram-positive (Penicilline) and Gram-negative bacteria (streptomycin)	Different authorised combinations of penicillin and streptomycin indicate divergent dosing regimens and treatment durations for the same species and indications. For Repen - according to the SPC, the authorised treatment duration is limited to 3 days.	Duration	Variability among SPCs for combination products complicates treatment decisions and may result in inconsistent antimicrobial exposure. In practice, veterinarians adapt dosing based on clinical severity, lab test and response. In clinical practice, severe systemic infections often require longer treatment durations to achieve full clinical and bacteriological resolution. A fixed treatment duration of 3 days is frequently insufficient, particularly in acute or severe cases	Clinical experience and antimicrobial stewardship principles support consistent dosing strategies based on active substances and infection characteristics rather than on heterogeneous SPC instructions. Penicillin is a time-dependent beta-lactam antibiotic, and its efficacy is linked to the duration of time during which plasma concentrations remain above the minimum inhibitory concentration (MIC). Scientific literature and clinical guidelines indicate that treatment durations of 5–7 days are often necessary, with the duration adapted by the veterinarian according to the clinical response
Penicillin G (benzylpenicillin) complexed with procaine for IM e.g. Penovet, Ethacilin vet, Depocilline, Duplocilline, etc	Horses	Infections caused by micro-organisms sensitive to benzylpenicillin in horse.	12-20 mg/kg = 12.000-20.0000 IE/kg IM q 24	Dosage	The scientific literature recommends 22,000-25,000 IU i.e. 12.4 mg/kg q12h	Is a time-dependent antibiotic, which is why the plasma concentration must be above the MIC for the longest possible time in the dosing interval to achieve a bactericidal effect. For gram-positive infections it is at least 50% of the time and for gram-negative infections at least 80% of the time. Therefore, dosing twice a day is necessary in horses. Studies of pharmacokinetics and pharmacodynamics in horses have led to recommendations of a dose of 22,000 IU/kg (equivalent to 22 mg/kg) (Sullins, Messer & Nelson. 1984, Uboh et al. 2000). https://www.frontiersin.org/journals/microbiology/articles/10.3389/fmicb.2023.1282949/full https://pubmed.ncbi.nlm.nih.gov/articles/PMC11176610/

Potassium penicillin G (e.g. Norocillin 300 mg/ml Suspension for Injection)	Horses	For foal with acute abdomen surgery SPC indications: For the treatment of systemic infections caused by or associated with organisms sensitive to penicillin.	SPC dose: The recommended dosage rate is 10 mg/kg bodyweight procaine penicillin, equivalent to 1 ml per 30 kg bodyweight daily in cattle, sheep and pigs; and 12 mg/kg bodyweight in horses. The treatment duration is 3 to 7 days.	Dosage	Recommended dose of procaine penicillin in a postoperative acute abdomen foal is greater than the SPC, and is four times a day, not once as listed in SPC.	Gillen, A. (2024). The Acute Abdomen in the Neonatal Foal. In Equine Neonatal Medicine (eds D.M. Wong and P.A. Wilkins). https://doi-org.ucd.idm.oclc.org/10.1002/9781119617228.ch18
Procaine benzylpenicillin (Penicillin G) – examples: Penovet and/or Ethacilin	Pigs	Bacterial infections caused by penicillin-sensitive organisms e.g. Meningitis	These products contain the same active substance but are authorized with different dosing recommendations. Penovet is authorized at 1 ml/15-30 kg, while Ethacilin is authorized at 1 ml/20 kg. In practice, this illustrates how products with identical active ingredients can still be approved with different dosing regimens, which may limit the veterinarian's ability to choose freely within the same substance group despite equivalent pharmacological content. There is additionally a difference in the spectrum of bacteria that can be treated with the two identical products. Ethacilin cannot treat <i>Actinobacillus pleuropneumoniae</i> , whereas Penovet can.	Dosage	When a pig or piglet has meningitis the correct treatment is to give it 4 times the approved dose of Ethacilin as the blood-brain barrier is a limit to the concentration within the brain.	It is necessary to follow clinical decision-making according to the individual animal's response and the specific infection dynamics.
Sulfadoxin/TMP (e.g. Borgal and Sultrivet)	Pigs	Susceptible infections	1ml/15 kg for 4-6 days	Duration	In pigs in DK, it has for many years been used for only 3 days with good effect	
Tetracycline (e.g. Engemycin 100mg/ml MSD)	Horses	For the treatment of infections caused by organisms sensitive to oxytetracycline e.g. Leptospiroses, lawsonia, ehrlichiose	Administration may be carried out according to two regimens: 24-hour regimen: Repeated administration of the recommended dose in the range of 3–10 mg oxytetracycline per kg body weight (depending on the age and species of the animals) at 24-hour intervals, for a total of 3–5 days (i.e., an initial dose followed by four repeat doses, for a total of five administrations). Oxytetracycline: IV 5-10 mg/kg BID 3-5 days Doxycycline: PO	Dosage/Duration	Tetracyclines are unusual in that they are a both time and concentration dependent. they need a high concentration and a long duration for best effect. Literature often recommends q12h dosing regime Oxytetracycline IV: 5-10 mg/kg SID or BID 5 to 10 days Doxycycline 10-20 mg/Kg PO (watch out for colic) up to 3 weeks	Equine Hospital Manual; Corley K, Stephen J. Blackwell 2008 BAPTISTE, K. E., POKLUDOVÁ, L. Antimicrobial Considerations for Horses. In: Antimicrobials in Livestock 2: Choices of Prevention and Treatment: A European Perspective. Cham; Springer Nature Switzerland, 2025:319-356 Publication Pustrella 2013/Venner
Trimethoprim/Sulphonamide combinations	Cattle/Calves	Used for respiratory infections, gastrointestinal infections, urinary tract infections, reproductive tract infections, septicaemia, wound and soft-tissue infections - indications differ per product Navel ill in calves Severe mastitis (grade 3), systemic bacterial infections	Dose ranges and durations vary, indications also differ	Dosage	For specific bacterial diseases listed in the SPC, higher doses are recommended based on scientific literature and basic PK/PD principles (e.g. 5 mg/kg TMP & 25 mg/kg sulfadiazine orally in calves, or 2.5 mg/kg TMP & 12.5 mg/kg sulfadiazine per injection in cows)	Many SPC doses for older antimicrobials were established in the 1970s–1980s, often at prophylactic or subtherapeutic levels, before modern PK/PD methodologies were available and before current resistance patterns emerged. These doses may no longer reliably achieve therapeutic exposure. Studies show that it is necessary to administer twice a day to achieve an adequate MIC level (Bienert-Zeit et al., 2015; Plumb, 2002)

Trimethoprim/sulphonamide combinations	Horses	For susceptible organisms to the combination of TMS such as upper respiratory disease, urogenital system and wound infections	Several doses, but generally 5 mg trimethoprim/ 25 mg sulfadiazin per kg, once a day 30 mg/kg (1:5 TMP/S ratio) q24h	Dosage	The scientific literature recommend oral and i.v. dose rate is 15/24–30 mg/kg (in a 1:5 TMP/S ratio) q12 h . Admin route iv or po depends on product e.g. Sulfadoxin or sulfadiazin with TMP.	Is a time-dependent antibiotic, which is why the plasma concentration must be above the MIC for the longest possible time in the dosing interval to achieve a bactericidal effect. BAPTISTE, K. E., POKLUDOVÁ, L. Antimicrobial Considerations for Horses. In: Antimicrobials in Livestock 2: Choices of Prevention and Treatment: A European Perspective. Cham; Springer Nature Switzerland, 2025:319-356 Twice daily administration is recommended in the treatment of the vast majority of equine bacterial infections (Gustafsson et al 1999). Studies of the drug's pharmacokinetics and pharmacodynamics also show that it should be administered in a dose up to 30 mg/kg (Gustafsson et al 1999). https://onlinelibrary.wiley.com/doi/10.1111/j.1365-2885.1994.tb00524.x
Tulathromycin (e.g. Draxxin)	Cattle	Bovine Respiratory Disease	Single subcutaneous injection of 2,5mg tulathromycin/kg. For cattle over 300kg bodyweight, the dose needs to be divided so that no more than 7,5ml are injected at one site.	Duration	Extended treatment may be needed for M. bovis with reduced susceptibility. Repeat dosing before authorized interval in severe infections with elevated pathogen MICs.	EMA Reflection Paper on Dose Optimization recognizes need for PK/PD-based dosing. Published studies show subtherapeutic concentrations in some clinical scenarios.
Tulathromycin (e.g. Draxxin)	Pigs	Porcine Respiratory Disease Complex	SPC: 2.5 mg/kg single IM injection.	Dosage	Clinical need: 3.5-7.5 mg/kg to achieve bactericidal effect and avoid Mutant Selection Window (MSW).	Yao et al. Front Vet Sci 2022: %T>MIC of 96.38% required for bactericidal activity. Wang & Zhang Front Vet Sci 2024: MPC of 44.8 mcg/mL; standard dose places pulmonary concentrations within MSW promoting resistance. Studies demonstrate doses up to 13.25 mg/kg needed to eliminate tonsillar reservoirs.
Tetracycline uterine rods, e.g. Tetra-Bol®	Cattle	Prophylaxis/therapy in the puerperium (after obstetrics, in retentio secundinarum, in endometritides)	Intrauterine Application: 2 g/animal/day, 1 to 3 times at intervals of 1 - 2 days.	Dosage	too low dosage for lege artis treatment	According to Ghallab et al. (2023), higher fertilization and pregnancy rates in the OTCC20% group (=4g/animal) (63, 63%) compared to the OTCC5% group (= 1 g/animal) (50, 10%) https://doi.org/10.1007/s11250-023-03536-0