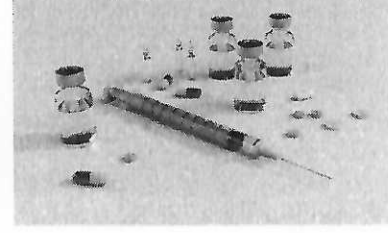


राष्ट्रिय भेटेरिनरी प्रतिजैविक प्रयोग सम्बन्धी निर्देशन, २०८२
(National Veterinary Antimicrobial Use Direction, 2026)



नेपाल सरकार
कृषि तथा पशुपन्छी विकास मन्त्रालय
पशु स्वास्थ्य महाशाखा
सिंहदरबार, काठमाडौं

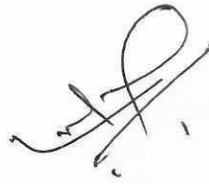
१६.०७.२०८२

१६.०७.२०८२

१६.०७.२०८२

पृष्ठभूमी

नेपाल विश्व पशु स्वास्थ्य संगठन (World Organization for Animal Health) को सदस्य राष्ट्र भएको र Antimicrobials को प्रयोग समेत विश्व पशु स्वास्थ्य संगठनको Guide line अनुरूप हुनुपर्ने प्रावधान अनुसार यो निर्देशन तयार गरिएको छ। हाल विश्वव्यापी समस्याको रूपमा देखिएको प्रतिजैविक प्रतिरोध (Antimicrobial Resistance) न्यूनीकरण गर्न प्रतिजैविक औषधिको उचित प्रयोग, एक स्वास्थ्य अवधारणाको प्रभावकारी कार्यान्वयन गर्दै समग्र पशुपालन क्षेत्रको विकासमा समेत यस निर्देशनले ले सकारात्मक प्रभाव पार्ने देखिन्छ। प्रतिजैविक प्रतिरोध न्यूनीकरणका लागि नेपाल सरकार (मन्त्रिपरिषद) बाट मिति २०८०/११/१४ मा स्वीकृत “प्रतिजैविक प्रतिरोध राष्ट्रिय कार्य योजना (२०८०/८१ देखि २०८४/८५) को बुँदा नं. ५.४.४ मा पशु स्वास्थ्यमा एन्टिमाइक्रोबियल स्टेवार्डसिप (उद्देश्य: पशु स्वास्थ्य सेवामा प्रतिजैविक औषधिको समुचित प्रयोगमा सुधार गर्ने)” भन्ने उल्लेख भएकोले उक्त प्रावधान कार्यान्वयन गर्दै प्रतिजैविक प्रतिरोध राष्ट्रिय कार्य योजनाको मर्म र भावना अनुरूप Antimicrobials को प्रयोगका लागि राष्ट्रिय भेटेरिनरी प्रतिजैविक प्रयोग सम्बन्धी निर्देशन आवश्यक देखिएकोले सुशासन (व्यवस्थापन तथा सञ्चालन) ऐन, २०६४ को दफा ११(२) (च) ले दिएको अधिकार बमोजिम नेपाल सरकार (सचिवस्तर) को मिति २०८२/११/... को निर्णय अनुसार मन्त्रालयले “राष्ट्रिय भेटेरिनरी प्रतिजैविक प्रयोग सम्बन्धी निर्देशन, २०८२” (National Veterinary Antimicrobial Use Direction, 2026) जारी गरेको छ।



Antimicrobials



Antimicrobials are chemical substances of biological, semi-synthetic, or synthetic origin that kill or inhibit the growth of microorganisms. Examples include antibacterials, antivirals, antiparasitics, antifungals, antiseptics, disinfectants etc.

General principles of antimicrobial therapy

Avoid the need of antimicrobials

Avoid inappropriate use of antimicrobials in animals

Choose right drug for right pathogen

Monitor antimicrobial sensitivity

Record and justify the use of antimicrobials

Handwritten signature/initials.

Handwritten signature/initials.

Handwritten signature/initials.

Spectrum of activity and mode of action of antimicrobials

Antimicrobials	Spectrum of activity	Mode of action
Sulphonamides (Sulphamethoxazole, Sulphadimidine, Sulphadiazine, Sulphaquinoxaline, Trimethoprim)	Broad spectrum, Eimeria + Toxoplasma (not work for Mycoplasma & Mycobacterium)	Folic Acid synthesis inhibition
Aminoglycosides (Streptomycin, Neomycin, Gentamicin, Amikacin, Tobramycin)	More active against gram -ve bacilli (Gentamycin also works for gram +)	Protein synthesis inhibitor (30s ribosome)
Tetracycline (Tetracycline, Chlortetracycline, Oxytetracycline, Doxycycline)	Broad (Bacteria, Mycoplasma, Chlamydia, Rickettsia, Anaplasma, Borrelia, Babesia etc.	Protein synthesis inhibitor (30S ribosomal subunit)
Amphenicols (Chloramphenicol, Florfenicol)	Broad (Gram +, Gram -, anaerobes)	Protein synthesis inhibitor (50S)
Macrolides (Azithromycin, Tylosin)	Broad (Mycoplasma & Chlamydia also).	Protein synthesis inhibitor (50S)
Quinolones (Norfloxacin, Ciprofloxacin, Enro, Marbofloxacin, Levofloxacin)	Broad (Gram +, Gram -)	Inhibition of DNA replication and transcription
β -lactam/Penicillin, Ampicillin, Amoxicillin, Penicillinase-resistant penicillins (e.g., Cloxacillin, Methicillin), β -lactamase inhibitor)	Gram +ve only: Benzyl- penicillin and cloxacillin Broad spectrum: Ampicillin, Amoxicillin, (β -lactam + Calvulinic acid/ Sublactum/ Tazobactam)	Inhibits bacterial cell wall synthesis by binding PBPs causing bacterial lysis
β -lactam/Cephalosporin (Cefalotin, Cefalexin, Cefuroxime, Cefaclor, Cefotaxime, Ceftriaxone, Ceftizoxime, Cefexime, Ceftiofur, Cefepime, Cefquinome, Ceftobiprole, Cefazoline)	Broad spectrum (1 st generation –mostly gram +ve)	Inhibits bacterial cell wall synthesis by binding PBPs causing bacterial lysis
Lincosamides (Clindamycin, Lincomycin)	Gram +ve (Clostridium), anaerobes, Mycoplasma	Inhibits protein synthesis (50S)
Polypeptides (Polymyxin B, Colistin)	Gram – ve	Disrupts cell membrane
Nitroimidazoles (Metronidazole)	Anaerobes, protozoa (Giardia)	Disrupts DNA synthesis

Handwritten signature

Handwritten signature

Handwritten signature

Mechanisms of antimicrobial resistance



Class of antimicrobials	Mechanism of resistance
Sulfonamides/ Trimethoprim	Altered target enzymes, PABA overproduction, plasmid-mediated genes
Aminoglycosides	Enzymatic modification, ribosomal mutation, efflux pumps
Tetracyclines	Efflux pumps, ribosomal protection, enzymatic inactivation
Amphenicols (Chloramphenicol, Florfenicol)	Acetyltransferase-mediated drug inactivation, efflux pumps, ribosomal mutation
Macrolides	Target site methylation, efflux pumps, enzymatic inactivation
Fluoroquinolones	Target modification (DNA gyrase/topoisomerase), efflux, plasmid qnr genes
Beta-lactams	Beta-lactamase production, altered PBPs, reduced permeability
Metronidazole	Reduced drug activation (nitroreductase mutations), efflux pumps
Polymyxins	Lipid A modification (mcr genes), efflux/reduced uptake

Handwritten signature

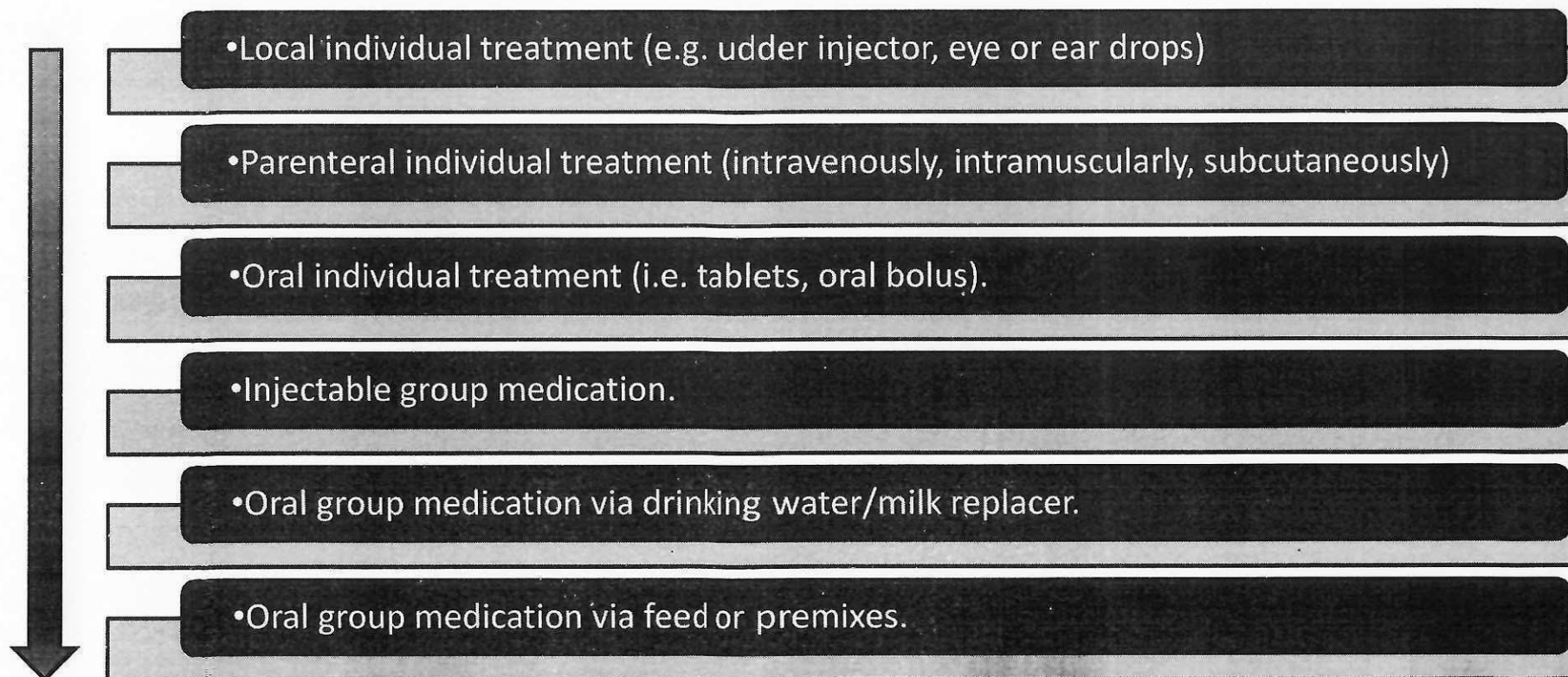
Handwritten signature

Handwritten signature



Impact of route of administration on development of antibiotic resistance

(From low to high chance on impact of antibiotic resistance (EMA, 2019))



Handwritten signature

Handwritten signature

Handwritten signature

WoAH classification of veterinary important antimicrobial agents (WoAH, 2025)



Veterinary Critically Important Antimicrobial Agents (VCIA)	Highly Important Antimicrobial Agents (VHIA)	Veterinary Important Antimicrobial Agents (VIA)
Importance in veterinary medicine and essential against specific infections and lack of sufficient therapeutic alternatives.	Importance in veterinary medicine or essential against specific infections and lack of sufficient therapeutic alternatives.	Not important in veterinary medicine and alternative available.
• Aminoglycosides: Amikacin, Gentamycin, Neomycin, Tobramycin • Amphenicols : Chloramphenicol , Florfenicol • Cephalosporins: Cefexime, Ceftiofur, Ceftriaxone, Cefovacin, Cefquinome • Macrolids: Azithromycin, Tylosin, Tilmicosin, Tylvalosin • Penicillins: Benzylpenicillin, procain penicillin, Amoxacillin, Ampicillin, Amoxi+ Calvulanic acid, cloxacillin, • Quinolones: Cipro, Dano, Enro, ofloxacin, Marbofloxacin • Sulphonamides • Tetracyclines: Chlortetracycline, Doxycycline, Oxytetracycline, Tetracycline	• Rifampicin • Cephalosporins: Cefalexin, Cefalotin, Cefazolin, Cefuroxime • Ionophores: Lasalocid, Maduramycin, Monensin, Salinomycin • Lincomycin/Clindamycin • Pleuromutilins: Tiamulin, Valnemulin • Bacitracin • Polymixin E Colistin • Quinolones: Flumequine, Nalidixic acid	• Fusidic Acid • Virginiamycin • Novobiocin

[Signature]

[Signature]

[Signature]

POULTRY

Pages 2-14

Systemic Disease, Respiratory Disease, Gastrointestinal Disease, Skin and Locomotory Disease, Miscellaneous Disease, Antibiotics, Anthelmintics and anticoccidials, Disease Investigation, Laboratory sample collection, Dosing guidance and Antibiotic Use Guidelines

CATTLE

Pages 15-26

Lameness, Respiratory Disease, Calf Disease, Mastitis, Reproductive Disease, Neurological Disease, Gastrointestinal Disease Miscellaneous, Vector borne disease, Antibiotics, Dosing Guidance, Antibiotic Use Guidelines

SHEEP GOATS

Pages 27-35

Lameness, Skin, Respiratory, Acute death, Reproductive, Miscellaneous, Lambs/kids, Antibiotics, Antibiotic Use Guidelines

PIGS

Pages 36-45

Skin, Lameness, Reproductive, Miscellaneous, Diarrhoea, Respiratory, Antibiotics, Antibiotic Use Guidelines

DOGS CATS

Pages 46-56

Skin, Skin/Ears, Urinary, Eyes, Gastrointestinal, Systemic, Respiratory, Antibiotic use for surgery, Antibiotics, Antibiotic Use Guidelines

ALL SPECIES

Pages 57-60

Recommended vaccines, Clinical parameters

Disclaimer: *It remains the sole responsibility of the prescribing veterinarian to confirm the dose, withdrawal period and suitability of all medications. This document is intended as a guide only, complex situations may require deviation from suggested treatments and use of independent clinical judgement.*



Systemic Diseases



POULTRY

DISEASE	CLINICAL SIGNS	POSTMORTEM	Treatment/Control and Prevention
Colibacillosis <i>E. coli</i>	Variable: Gastrointestinal, Respiratory, Omphalitis, Colisepticaemia, Reproductive	Airsacculitis, enteritis, salpingitis, peritonitis, pericarditis, airsacculitis, perihepatitis, nodular organ lesions, salpingitis Omphalitis (chicks)	- Treatment with antibiotics is not often recommended, try to identify the cause of infection by addressing hygiene and concurrent infections (e.g. IBD, CRD, contaminated water supply). - Multi-drug resistance common so culture and antibiotic sensitivity testing is highly recommended. - Treatment options: Guided by culture and AST as resistance levels high. Do not use fluoroquinolones (e.g. ciprofloxacin, norfloxacin) without culture and sensitivity as resistance against these medications very high. - Ensure water quality (add sanitizer/acidifiers). Vaccination if available
Fowl Cholera <i>Pasteurella multocida</i>	Increased mortality, depression, anorexia, fever, diarrhoea, rapid breathing, swollen wattles/joints, torticollis	Haemorrhages on heart, gizzard, fat, consolidation of lungs, liver congested or yellow +/- white necrotic lesions. Swollen wattles, exudate in joint and tendon sheaths, free yolk in peritoneal cavity.	- Multi-drug resistance common so culture and antibiotic sensitivity testing is highly recommended. - Treatment options: Trimethoprim-sulphonamide for 3-5 days or Amoxicillin for 3-5 days or Tetracyclines for 5-7 days or - Vaccination if available
Pullorum Disease <i>Salmonella pullorum</i>	Death soon after hatch, anorexia, white diarrhoea/pasted vent	Young birds: unabsorbed yolk sac, grey nodules in liver/spleen/lungs/heart/gizzard/intestine, swollen joints. Adult: usually no lesions, nodular pericarditis, fibrinous peritonitis, misshapen caseous ovaries, testicular abscess.	- Treatment of salmonellosis (<i>S. pullorum</i> and <i>S. gallinarum</i>) not recommended except for young chicks with clinical signs. - Prevention, biosecurity measures and eradication of infected carrier birds preferred. - Biosecurity prevents horizontal transmission and testing of breeding flocks can prevent vertical transmission. - Check for concurrent diseases causing immunosuppression. - Survivors often become carriers with ovarian infection producing infected offspring. - Antibiotics do not eliminate infection and can increase carrier state. - Treatment choice: Amoxicillin for 3-5 days or based upon culture and sensitivity. Vaccines available.
Fowl Typhoid <i>Salmonella gallinarum</i>	Moribund/dead chicks, white pasty vents, anorexia, laboured breathing. Drop in feed, depressed, fever, green diarrhoea, death	Young: similar to pullorum with unabsorbed yolk sac and grey nodules. Adult: swollen, friable, bile stained liver, enlarged dark spleen and kidneys, anaemia, enteritis	

Handwritten signature

Handwritten signature

Handwritten signature

Respiratory Diseases



POULTRY

DISEASE	CLINICAL SIGNS	POSTMORTEM	TREATMENT	Control and Prevention
Mycoplasmosis <i>Mycoplasma gallisepticum</i>	Respiratory- rales, difficulty breathing, sneezing, coughing, nasal discharge, conjunctivitis, poor physical condition, loss of weight performance	Exudate in respiratory passages, cloudiness of air sac with exudate or a caseous/yellow appearance, fibrinous pericarditis and perihepatitis	- Tylosin in water once a day for 3-5 days or - Tiamulin fumarate in water once a day for 3-5 days (do not use concurrently with ionophore anticoccidials) or - Tilmicosin in water for 5 days	- Vertical transmission possible with F-strain - Obtain chicks from Mg free flocks. Multiage flocks make control difficult- presence of cull birds on farm is a risk factor for re- infection of next flock. - Vaccine if available
Infectious Coryza <i>Avibacterium paragallinarum</i>	Clear to purulent nasal discharge, swelling of infraorbital sinuses, eyes closed, dyspnoea, loss of condition.	White- yellow pus and mucus in infraorbital sinus, subcutaneous oedema of face/wattles, catarrhal conjunctivitis, tracheitis, pneumonia	- Tetracyclines daily for 5-7 days or - Amoxicillin for 3-5 days or Erythromycin 3-5 days	- Vaccine if available - Depopulate and disinfect between cycles - Obtain birds from 'free' flocks
Avian Influenza (AI) <i>Avian Influenza Virus</i>	LPAI: sneezing, coughing, ocular and nasal discharge, and swollen infraorbital sinuses in poultry HPAI: sudden death, cyanosis/oedema of head, necrosis of comb/wattles, oedema/dischouration of feet, green diarrhoea. Neurological signs.	Congestion and inflammation of the trachea and lungs. Petechial haemorrhage, oedema and necrosis of organs/muscles.	- No antimicrobial treatment effective. - Low pathogenic strains can use antimicrobials to control any secondary infections. - Flocks infected with High Pathogenic AI (HPAI) are subject to compulsory culling (stamping out).	- Vaccine if available (LPAI) - Biosecurity to prevent disease entering flock. - Zoonotic Risk. - Notifiable disease
Infectious Laryngo-tracheitis (ILT) <i>Infectious laryngotracheitis virus</i>	Respiratory distress, coughing, rales, gasping, bloody mucous. Nasal/ocular discharge, tracheitis, conjunctivitis	Tracheal mucosa congested, haemorrhagic with exudates. Mucosa oedema.	- No antimicrobial treatment effective. - Vaccination - administration to birds during an outbreak. Can also be used to prevent infection - Infection from ILT positive birds is very pathogenic	- Biosecurity to prevent infection. - Birds are carriers for life after infection and can be reactivated under stressful conditions.

np. 1/1

1/1

1/1

Gastrointestinal Diseases



POULTRY

DISEASE	CLINICAL SIGNS	POSTMORTEM	TREATMENT	Control and prevention
Necrotic Enteritis <i>Clostridium perfringens</i> A, C	Death, up to 20% mortality Depression, inappetence, anorexia, dark diarrhoea, emaciation	Dehydration, water in crop, intestines ballooned with gas- foul smelling brown liquid. Mucosa has ulcers, light yellow spots or 'Turkish towel' appearance. Dark congested liver.	- Amoxicillin for 3-5 days or Tetracyclines for 5-7 days - Lincomycin for 3-5 days.	- Probiotics reduce severity. - Disinfection and feed management - Control of coccidia important in prevention.
Ulcerative Enteritis <i>Clostridium colinum</i>	Sudden mortality in good condition Listless, ruffled feathers, white diarrhoea, emaciation, death	Water in crop, small round ulcers surrounded by haemorrhage in SI, ceca and LI. Perforate and peritonitis. Yellow to gray necrotic foci in liver.	- Amoxicillin twice a day for 3-5 days or - Lincomycin twice a day for 3-5 days	- Probiotics reduce severity. - Add salt to flooring. - Remove contaminated litter. - Reduce stress and control coccidiosis.
Coccidiosis <i>Eimeria</i> spp	Depressed, ruffled feathers, dehydration, weight loss Muroid/bloody diarrhoea, high mortality	E. tenella- cecal erosion, free blood. E. necatrix- midgut small white or red spots on serosa, 'salt and pepper' appearance, ballooning of gut, bloody mucous exudate. E. maxima- thickening of intestinal wall	- Amprolium (choice for cecal coccidiosis) for 5-7 days or - Toltrazuril once a day for 2 days (Toltrazuril does not allow for immunity development) - Sulphonamides Sulphamethoxazole, Sulphadimidine) & Trimethoprim for 3-5 days. - Tetracyclines once a day for 5-7 days or Lincomycin twice a day for 5 days	- Routine disinfection with 14% lime mixed with litter. Vaccines. - Continuous use of anticoccidials promotes resistance. - Rotation of anticoccidials is important. - Prevention is best option
Spotty Liver Disease <i>Campylobacter hepaticum</i>	Non-specific, decreased egg production, increased mortality rates	Liver- multiple areas of focal necrosis	Tetracyclines once a day for 5-7 days or Lincomycin twice a day for 5 days	- Most commonly breeder and layer birds. - Reducing the shed temperature may help reduce losses.
Intestinal Worms	Reduced appetite, weight loss/ill thrift, pale combs, intermittent diarrhoea, abnormal droppings, reduced egg production.	Worms in faeces or seen during postmortem. Faecal flotation test needed to detect eggs.	- Levamisole (should be consumed in 12 hours) or - Albendazole (nematodes and cestodes). - Piperazine (nematodes)	- Biosecurity is key to prevention. - Albendazole is recommend for 2 days. - Anthelmintics may need to repeat treatment 17-21 days later. - Rotation of anthelmintics. - Practice good hygiene and keep housing dry.

Skin and Locomotor Diseases



POULTRY

DISEASE	CLINICAL SIGNS	POSTMORTEM	TREATMENT	Control & Prevention
Gangrenous Dermatitis <i>Clostridium septicum</i> , <i>Clostridium perfringens</i> , <i>Staph spp</i> , <i>E-coli</i>	Depression, incoordination, inappetence, leg weakness, ataxia, high fever	Dark red purple to green, weepy areas of skin- abdomen, breast, wings or legs. Necrotic areas haemorrhagic, considerable oedema and gas	- Reasonable options are Erythromycin, Amoxicillin, Tylosin or Tetracyclines. - Culture and sensitivity may be required to identify pathogen and sensitivities.	- Eliminate source of trauma and stress - Clean and disinfect - Add salt to flooring
Pododermatitis 'Bumblefoot' <i>Staphylococcal spp.</i>	Hard, pus-filled abscess on the bottom of the chicken foot covered by a dark scab. Inflammation and swelling in the area Reluctant to walk and appear lame	Diagnosed off clinical signs alone.	- Culture and sensitivity strongly recommended due to variable susceptibility of <i>Staph aureus</i>. - First choice: Amoxicillin - Other options: Erythromycin, Tylosin, Tetracyclines. - Treat only the affected birds unless not practical.	- Alter management- e.g. flooring, hygiene and keeping shed clean and dry. - Remove sources of trauma.
Lameness <i>Mycoplasma synoviae</i> , <i>E-coli</i> , <i>Pasteurella multocida</i> , <i>Staph aureus</i> , <i>Enterococci</i>	Variable dependant on causative agent.	Take samples at postmortem for culture and sensitivity where bacterial cause suspected and wait for results before treating.	- Rule out nutritional or developmental causes of lameness first. - Most cases are chronic and can wait for culture and antibiotic sensitivity testing to be performed before antibiotics given. - Treatment is often not effective at resolving problem. - Staphylococcus and Enterococcus: amoxicillin, erythromycin or tylosin are options - Mycoplasma and E-coli: see previous advice. - Treat for 3-5 days	- Lameness often a secondary problem. - Identify primary cause of disease and use management change and vaccinations where available. - Important to give farmer appropriate counselling about prognosis

nbrii

nbrii

nbrii

Miscellaneous Diseases



POULTRY

DISEASE NAME	CLINICAL SIGNS	POSTMORTEM	TREATMENT	Control and Prevention
Infectious Bursal Disease (Gumboro) <i>Infectious Bursal Disease virus</i>	Incoordination, watery white diarrhea, soiled vent, vent picking, cloaca inflammation	Cloacal bursa enlarged, oedematous with yellow transudate on surface and haemorrhages observed on surface. Hemorrhages in muscle, Sometimes cloacal bursa atrophied.	- No antibiotics will be effective. - Supportive treatment only.	- Vaccination especially of breeder flocks to pass on maternal immunity. - Birds then require further vaccination. - Disinfection after depopulation as virus stable in the environment.
Newcastle disease <i>Newcastle disease virus</i>	Lethargy, anorexia, respiratory distress (whistling), clear discharge from mouth, sudden death, high mortality, green diarrhoea, neurological signs	Usually found with viscerotropic velogenic ND. Petechiae on serous membranes, proventriculus, haemorrhage of mucosal surface esp caecal tonsils and peyers patches. Congestion and haemorrhage of trachea and lung.	- No medication has been shown to have any effect on the course of disease. - Antimicrobials can be used in flocks with low virulence strains to prevent secondary infection (e.g. tetracyclines).	- Vaccination. - Biosecurity and thorough disinfection processes are vital to control spread.
Inclusion Body Hepatitis <i>Adenovirus</i>	Sudden mortality < 6 weeks age. Nonspecific clinical signs- lethargy, huddling, yellow mucoid droppings	Liver swollen, yellow discolouration and red/pale foci.	- No specific treatment available. - Antimicrobials may help control secondary infections (e.g. tetracyclines).	Vaccination- breeder vaccination confers immunity to young chicks.

Handwritten signature

Handwritten signature

Handwritten signature

Antibiotics



POULTRY

ANTIBIOTIC	DOSE	WITHDRAWAL PERIOD		CONTRAINDICATIONS/ WARNINGS	SPECTRUM OF ACTIVITY
		MEAT	EGGS		
Amoxicillin trihydrate	20mg/kg	1 or 2 days	0 days or DNU	Check licence on product if 0 egg withdrawal.	Broad spectrum, Gram +ve and -ve. Bacteriocidal.
Cephalexin	50-125mg/kg	Caution- No data available	0 days	Limited data on withdrawal times for meat, refer to packet for information.	Bacteriocidal. Broad spectrum.
Ciprofloxacin	20mg/kg	12-15 days (up to 23)*	DNU	*Not recommended for use in poultry due to human health risk from prolonged residues.	Bactericidal, broad spectrum. Gram +ve and -ve
Chlortetracycline	60mg/kg	2, 4, 7 days	0	Not for use with calcium or sodium bicarbonate	Bacteriostatic, broad spectrum, Gram +ve and -ve, mycoplasma
Doxycycline	10mg/kg	7 days	DNU	Do not use with bacteriocidal antibiotics. Do not use in birds laying eggs for human consumption	Broad spectrum, Gram +ve and -ve and mycoplasma
Erythromycin	20mg/kg	7 days	DNU	Do not use in birds laying eggs for human consumption. Avoid with monensin	Bacteriostatic, Gram +ve and some gram -ve, mycoplasma
Florfenicol	30mg/kg	7 days	DNU	Do not use with tetracyclines or macrolides. Significant solubility issues exist- ensure medication fully dissolved in solution.	Bacteriostatic, broad spectrum Gram -ve (E-coli, Salmonella) and +ve cocci (Staph/Strep), Mycoplasma and clostridium.
Neomycin	10mg/kg	5 days	5 days	Potential nephrotoxicity. Mainly active in gastrointestinal tract, poor systemic action.	Gram -ve (Salmonella, E-coli, Enterobacter), NOT pseudomonas.

Withdrawal period is product specific so review label to confirm. Some recommendations may represent 'off-licence' doses. DNU= Do not use

Handwritten signature

Handwritten signature

Handwritten signature

Antibiotics



POULTRY

ANTIBIOTIC	DOSE	WITHDRAWAL PERIOD		CONTRAINDICATIONS/ WARNINGS	SPECTRUM OF ACTIVITY
		MEAT	EGGS		
Norfloxacin	15mg/kg	12 days	Unknown, DNU	Do not use with tetracyclines, chloramphenicol, macrolides C lincosamides	Broad-spectrum- acts against gram-negative and less so gram +ve bacteria
Oxytetracycline	70mg/kg	7 days	DNU	Not for use in egg laying birds for human consumption	Bacteriostatic, broad spectrum, gram +ve and gram -ve. Not pseudomonas.
Tiamulin Fumarate	25-50mg/kg	5 days	5 days	Do not use within 7 days of monensin, narasin or salinomycin	Bacteriostatic. Gram +ve and mycoplasma.
Tilmicosin	30mg/kg	9 days	DNU	Do not use with bacteriostatic antimicrobials. Do not use in birds laying eggs for human consumption.	Bacteriocidal, effective for gram +ve (particularly Pasteurella, Actinobacillus and Mycoplasma).
Trimethoprim/ Sulphonamide	30mg/kg (<2 WO) 15mg/kg (>2 WO)	14 days	DNU	Do not use in birds laying eggs for human consumption	Bacteriostatic, Broad spectrum. Gram +ve and Gram -ve
Tylvalosine tartrate	25mg/kg	2 days	0 days	No compatibility studies- do not mix with other antibiotics/medications	Bacteriostatic, Gram +ve bacteria and mycoplasma
Tylosin	50mg/kg	1 days	0 or 5 days	Avoid disposing of waste product into the environment.	Bacteriostatic, Gram +ve and Gram -ve including Clostridium, Pasteurella and Mycoplasma spp
Zinc Bacitracin	200ppm	0 days	0 days	Administration by mixing into feed at appropriate concentration.	Gram +ve spectrum

Withdrawal period is product specific so review label to confirm. Some recommendations may represent 'off-licence' doses. DNU= Do not use

Handwritten signature

Handwritten signature

Handwritten signature

Anthelmintics and Anticoccidials



POULTRY

MEDICATION	DOSE	WITHDRAWAL PERIOD		CONTRAINDICATIONS/ WARNINGS
		MEAT	EGGS	
Toltrazuril	7mg/kg 3L medication / 1000L water	14 days	DNU	Do not use in birds laying eggs for human consumption
Diclurazil	(2.5% solution) = 1ml per 1 L	0 days	0 days	
Amprolium	20mg/kg	0 days	0 days	
Sulfaquinoxaline	*Review medication packet for dosing	14 days	DNU	Do not use in birds laying eggs for human consumption.
Monensin	100-120mg/kg	0 days	DNU	Not to be given with erythromycin, tiamulin or oleandomycin
Piperazine	200mg/kg	7 or 21 days	DNU	Do not use in birds laying eggs for human consumption
Levimasole	28mg/kg	7 days	0 days	
Fenbendazole	1mg/kg	8 days	0 days	

Withdrawal period is product specific so review label to confirm. Some recommendations may represent 'off-licence' doses. DNU= Do not use

Handwritten signature

Handwritten signature

Handwritten signature

Disease Investigation



POULTRY

SYNDROME	SAMPLES AND TESTING	DIFFERENTIAL DIAGNOSES
EARLY CHICK MORTALITY (high mortality 1-14 days)	Postmortem sick or recently dead chicks Submit swabs of lesions and tissue samples for PCR and bacterial culture. Submit whole chicks to the lab. Collect a thorough history of breeding conditions and vaccinations given. Inspect farm management (ventilation, temperature, food/water availability, hygiene) and biosecurity measures.	1-7 days: Yolk sac infection, Omphalitis, Aspergillosis, Non-starters (problems from poor breeding and incubation conditions), dehydration 7-14 days: Inclusion body hepatitis, Chicken anaemia virus, Aspergillosis, IBD, Poor vaccines, Poor management/breeding conditions. Diarrhoea/wet floors: infectious bronchitis virus, salmonella, e-coli, poor management
SUDDEN MORTALITY (with/without clinical signs)	Postmortem sick or recently dead birds. Collect swabs of heart blood into bacterial transport medium Collect femur for culture. Samples of affected tissue- e.g. liver, lung Swab of palatine cleft/trachea and choanal swab into viral transport medium PCR/Serology for viral diseases	Avian influenza, Newcastle disease, IBD erysipelas, Fowl Cholera, Necrotic Enteritis, spotty liver disease, coccidiosis, heat stress, smothering, calcium tetany, sudden/acute death syndrome
INCREASED MORTALITY (with chronic signs of septicaemia)		Chlamydia psittaci, Erysipelas, Fowl cholera, Spotty liver disease, Escherichia coli, Staphylococcus aureus, Salmonella species
RESPIRATORY	Swab choanal cleft/trachea and any affected tissue for viral testing (in viral transport medium), bacterial culture (in bacterial transport medium) and plain swabs. Collect fresh affected tissue in a sterile container. Sample spleen if chlamydia suspected. Collect minimum of 10 blood samples from live birds for serology.	Avian influenza, Newcastle disease, Infectious Bronchitis, Infectious Laryngotracheitis, Avian metapneumovirus, Infectious Coryza, Fowl Cholera, Aspergillosis, Mycoplasmosis, toxic (high ammonia).

Handwritten signature

Handwritten signature

Handwritten signature

Disease Investigation



POULTRY

SYNDROME	SAMPLES AND TESTING	DIFFERENTIAL DIAGNOSES
RELUCTANCE TO MOVE/LAMENESS	Postmortem affected birds- check footpads, any joint swelling, cartilage formation, lesions in abdomen, inspect sciatic nerve for mareks, incise vertebral column to check for abscesses. Swab any affected joints for culture, collect blood samples from live birds for serology. Collect feed samples if suspected as cause.	Mareks, E-coli, Fowl Cholera, Mycoplasma, Staph Aureus, Enterococcus, toxic (botulism), nutritional, developmental (kinky back), Tibial Dyschondroplasia, Ionophore toxicity.
NEUROLOGICAL	Postmortem dead or dying birds. Swab lesions and submit for PCR/Culture Collect swabs of heart blood for bacterial culture Collect blood samples from live birds for serology Feed samples if suspected If no obvious lesions, collect brain/nerve samples for histopathology	Mareks, Toxins (ionophores, botulism, ammonia), Nutritional, Avian encephalomyelitis virus, Vitamin E/B deficiency, Avian influenza, Newcastle disease, aspergillosis, Fowl cholera.
GASTROINTESTINAL	Postmortem of sick and recently dead birds. Gross lesions can be diagnostic (coccidiosis). Direct smear of intestines - microscopic exam Faecal material - faecal flotation test Feed sample- mycotoxin ELISA Tissue samples - histopathology	Necrotic enteritis, ulcerative enteritis, coccidiosis, parasites, nutritional problems, viral disease (Adenoviruses, enteroviruses, rotaviruses, coronavirus, astrovirus, reoviruses, parvovirus)

Handwritten signature

Handwritten signature

Handwritten signature

Laboratory Sample Collection



POULTRY

SAMPLE TYPE	COLLECTION TECHNIQUE	STORAGE AND TRANSPORT REQUIREMENT
Blood	Collect ~2mls whole blood into a serum tube. A swab of heart blood can be collected for culture, use a sterile swab to collect blood from inside the heart. Examine serum after centrifuging to ensure there is no gross lipaemia or haemolysis	Transport whole blood to lab as soon as possible. Or extract serum and send to lab chilled within 48 hours. Pour off serum after centrifuging into a sealed plain tube for transport to the lab. Keep serum chilled during transport or freeze if not possible to transport to lab within 48 hours.
Tissue Sample	Collect at post-mortem examination. Remove section of tissue to be tested and place into a sterile specimen container.	For histology examination the sample can be fixed in formalin for transport to the lab. Fresh samples should always be chilled and sent to the lab as soon as possible.
PCR Swab	Collect using a dry, sterile swab and transport either dry or in viral transport medium depending on the test required. Viral swabs should always be in viral transport medium, as desiccation can destroy pathogens	Transport chilled to the lab within 24 hours
Culture + Sensitivity Swab	Use sterile swab to collect sample from area of interest. Or, at post-mortem swab organs by searing the surface with a hot scalpel, cut surface and take swab from inside of organ. Swabs ideally should be placed in transport medium for culture.	Swabs in transport medium can be transported to the lab without refrigeration.
Whole bird	Bird should be recently dead or euthanised on site or transported to the lab to be euthanised there. Note, birds that have been dead for a prolonged period will not be suitable for culture and sensitivity testing or microscopic examination.	Transport dead birds to the lab in a plastic sealed bag, chilled or on ice. The birds should arrive at the lab as soon as possible.

nf

[Signature]

[Signature]

Dosing Guidance



POULTRY

Note: Water containing antibiotic should be made up fresh at the start of the day and discarded after 24/12/8 hours depending on the dosing interval.

Calculating dose:

1. Work out how much water is consumed by the flock in 24 hours
2. Work out total Mg dose using approximate bird weight
3. Calculate total grams of product to be added using concentration of medication on packet
4. Add total dose to total water allowance for the day.

Example:

Dose of antibiotic = 20mg/kg, 1000 bird flock with approximate weight 2kg

$20 \times 1000 \times 2 = 40,000$ mg (Total dose)

Medication concentration: 500mg/g so $40,000/500 = 80$ g per day.

Water consumption example: 2kg bird will be eating 100-125 gms of feed and drinking 180 to 225 mls per 24 hrs = 180 litres per day.

So, 80g antibiotic powder to 180L water and administer over 24 hours (for 1000 birds)

FLOCK WATER CONSUMPTION = (1.8 x feed consumption)

Calculate on the 24-hour period immediately before antibiotic administration

np

Antimicrobial Use Guidelines



POULTRY

Use

Amoxicillin
Oxytetracycline
Doxycycline
Chlortetracycline
Bacitracin Tiamulin
Erythromycin
Cephalexin

Think

Trimethoprim/Sulphonamide
Lincomycin
Tylvalosin
Tilmicosin
Florfenicol

Stop

Gentamycin, Neomycin,
Kanamycin
Fluroquinolones*:
enrofloxacin, norfloxacin,
ciprofloxacin, Levofloxacin
Virginiamycin

*Care with extended withdrawal periods

BLACK (CRITICAL) - DO NOT USE FOR ANY REASON:
Colistin, 3rd/4th generation Cephalosporins,
Metronidazole.

KEY:

Green: Use these antibiotics as a 1st choice option

Yellow: If a green option is not suitable then these are 2nd choice options

Red: Only use after culture and sensitivity testing, if no other option is available.

Lameness



CATTLE & BUFFALO

Diagnostics:

1. Examine cow for obvious swellings or injuries on affected leg, lift and examine hoof for lesions and use hoof testers to identify any painful areas.
2. Check joints for heat and swelling.
3. Identify non-infectious causes of lameness that do not require antibiotics and can be corrected with trimming or management **with foot bath alone**: sole bruising/ulcers, white line disease, fissures in hoof wall, conformational issues with hoof.

DISEASE	CLINICAL SIGNS	TREATMENT	CONTROL AND PREVENTION
Footrot <i>Fusobacterium necrophorum</i> + others	Sudden lameness in one or more hooves, swelling of interdigital space/coronet area, foul smell and necrosis between claws	• Single dose of Florfenicol or 3 days of procaine penicillin or oxytetracycline. • Topical disinfection of lesions.	• Regular hoof trimming • Keep feet clean and dry
Digital Dermatitis <i>Treponemes</i>	Lesions mostly around heel bulb (can be other places on hoof), lesions are painful, often bleed and cause extreme lameness	• Clean lesion thoroughly. • Topical treatment of lesions with tetracyclines is advised and bandaging keeps antibiotic in contact.	• Herd prevention with regular foot bathing: Formalin @ 5- 10% concentration or copper sulphate @ 10% concentration. Check cows for lesions on purchase.
Foot Abscess <i>Trueperella Pyogenes</i>	Often a consequence of white line disease. Lameness and pain in one foot. Dark lesion at white line that extends to an abscess after trimming.	• Antibiotics not required. • Create good drainage of the abscess with hoof trimming. • Add block to unaffected claw	• Hoof trimming. Clean non-slip flooring and gentle handling of cattle.
Septic Arthritis <i>Histophilus somni</i> , <i>Trueperella pyogenes</i> , <i>Mycoplasma bovis</i>	Severe lameness to non-weight bearing, joint swelling, pain, reduced range of motion. Heat and effusion.	• Culture of joint effusion can guide antibiotics. Florfenicol, Tilmicosin, Tulathromycin or oxytetracycline possible options. Non-steroidal anti-inflammatories needed. • Regional perfusion of antibiotics usually necessary.	• Poor prognosis, Segregation and isolation • Improve management of respiratory disease pathogens.
Foot and mouth disease <i>Foot and mouth disease virus</i>	Fever, blisters/vesicles/erosions around tongue, mouth, udder and hooves. Excess salivation, loss of appetite, lameness, abortions, low milk production, death.	• Supportive treatment only. Boric acid/Alum application in mouth lesion. KMnO4 dip in foot lesion. • Treatment of secondary infection should involve a first-line broad spectrum antibiotic such as oxytetracycline or penicillin. Non-steroidal anti-inflammatories can be given for pain.	• Vaccination and biosecurity of herd. Notifiable disease • Disinfection of premises with 0.2 % Citric acid • Isolation of sick animal

Respiratory



CATTLE & BUFFALO

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Pneumonia <i>Mannheimia</i> <i>haemolytica</i> , <i>Pasteurella</i> <i>multocida</i> + viral agents	Increased respiratory rate and/or effort, lethargy, anorexia, fever, coughing, mucopurulent nasal discharge. Signs of toxemia- scleral injection, increased heart rate and red mucous membranes.	Postmortem and identification of gross lesions in lungs- cranioventral lobes consolidated. Clinical exam on affected animal diagnostic - chest auscultation Serological testing- ELISA or PCR Culture and sensitivity from transtracheal aspiration.	• Florfenicol or Tilmicosin/Tulathromycin or Oxytetracycline or Trimethoprim- Sulphonamides • Plus, non-steroidal anti-inflammatory (NSAID)	• Vaccination available for some disease agents. • Reduce stress at weaning and transport, ensure adequate ventilation. • Improved management.
Calf Diphtheria <i>Fusobacterium necrophorum</i>	Increased respiratory effort, noise on inspiration, fever, halitosis, ulceration/necrosis of laryngeal mucosa, depression, cough.	Based on clinical examination. Can palpate larynx and see if this makes the stridor worse.	• Procaine penicillin for 3-5 days or Oxytetracycline long acting, repeated after 3 days or short acting repeated after 2 days. • Plus, non-steroidal anti-inflammatory or corticosteroid injection for swelling.	• Consider underlying diseases and foreign bodies. • Severe cases may require tracheostomy.
Contagious Bovine Pleuropneumonia <i>Mycoplasma Mycoides</i>	Acute death may occur Fever, decreased appetite, drop in milk production. Respiratory signs- coughing, mucopurulent nasal discharge and increased respiratory rate/effort. Thoracic pain if pressed between ribs. Arthritis in calves.	Clinical signs difficult to differentiate from pneumonia. Pneumonia in adults and arthritis in calves together in a herd is indicative. Postmortem - lesions in the lung, often unilateral, marbled appearance, exudate in pleural cavity. PCR or Serology available.	• Treatment not recommended unless in an endemic area as may not get rid of infection and carriers can develop. • Tylosin or Erythromycin or Oxytetracycline. • Plus, supportive care with non-steroidal anti-inflammatory	• Vaccination available • OIE reportable disease.

Handwritten signature

Handwritten signature

Handwritten signature

Calf Diseases



CATTLE & BUFFALO

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Neonatal Septicaemia	Depressed or comatose, fever or hypothermia, cold extremities, red mucous membranes, loss of suckle	Clinical signs sufficient.	Oxytetracycline or trimethoprim/sulphonamide for 5-7 days or longer if navel ill or septic arthritis occur.	- Hygiene around calving time important. - Ensure calves are receiving adequate colostrum. - Prevent from cold and hypothermia
Calf Diarrhoea <i>E-coli, Salmonella, Cryptosporidium, viruses.</i>	Diarrhoea, depression, collapse, inappetence, sometimes fever or hypothermia.	Most cases are not bacterial- make use of faecal examination, PCR, culture or rapid tests.	- Most cases are viral and antibiotics are not indicated. Antibiotics indicated if bacterial cause confirmed, collapsed or septic. - Trimethoprim/Sulphonamide or Oxytetracycline for 5 days. Fluid therapy most important to correct acidosis and dehydration. - Non-steroidal anti-inflammatories can be given once rehydrated.	- Hygiene is important, especially around calving. - Move newborn animals onto clean pasture. - Ensure calves are receiving adequate colostrum. - Prevent from cold and hypothermia

Fluid therapy guidelines for Calf Diarrhoea:

1. Calculate dehydration level:

Body weight x % Dehydrated / 100

Diarrhoea only, still drinking = 5%

Eyes slightly sunken, still drinking = 7%

Calf depressed, skin tent, not drinking = 9%

Calf cannot stand = 12%

e.g. 30kg calf 5% dehydrated = $30 \times 5 / 100 = 1.5\text{L}$ dehydrated

2. Calculate fluid needed:

Maintenance = 10% of body weight
30kg calf needs 3L/24 hours

Maintenance + dehydration requirement = total required.

3. Administer Fluids:

If drinking give oral electrolytes (2 hours apart from milk)
If not drinking enough then consider stomach tube
If not drinking then intravenous fluids suggested.

4. Correct acidosis:

If calf not able to stand or not drinking.
150mls 8.4% Sodium bicarbonate split between 2L of IV fluids - 0.9% Saline should be used only OR
32g of sodium bicarbonate powder, mixed with water for injection and split between first 2L of saline

5. Monitor ongoing fluids:

Give 2/3rds of the dehydration amount IV in the first hour then the remaining amount slowly over the next 2/3 hours. If drinking after IV fluids, switch to oral rehydration solution

Handwritten signature

Handwritten signature

Handwritten signature

Mastitis



CATTLE & BUFFALO

Potential pathogens: *Staph aureus*, *Coagulase negative Staph spp*, *Streptococcus spp*, *E-coli*, *Klebsiella*, *Pseudomonas*, *Proteus*, *Mycobacterium*, *Corynebacterium*, *Fungi*

DISEASE	CLINICAL SIGNS	TREATMENT
Severe, toxic mastitis with systemic signs <i>Gram negative</i>	Fever, depression, loss of appetite, dehydration, shock or collapse, changes in the milk, inflammation of udder	- Oxytetracycline intravenously for 5-7 days preferred as intramuscular and intramammary absorption poor. - Trimethoprim- sulphonamide intravenously another option. - Fluids and non-steroidal anti-inflammatories required.
Localised mastitis with no systemic signs	Changes in the milk or udder, increase in somatic cell count, potentially loss of appetite.	- Culture and sensitivity should be performed to determine if Gram negative or positive and because some pathogens have poor cure rates. <i>Klebsiella</i> and <i>E-coli</i> (Gram negative) are frequently cultured in Nepal and mild <i>E-coli</i> often self resolves. - Give an NSAID, plus supportive treatment e.g. frequent stripping whilst awaiting culture results. - Cold fomentation in acute and hot fomentation in recommended in chronic mastitis. Dipping in antiseptic solution is recommended for prevention. - If no growth on culture or <i>E-coli</i>: do not treat with antibiotics unless unwell systemically or > 3 days. <i>Klebsiella</i>- around 30 % will self cure, others may need treatment guided by sensitivity results. Cows may become carriers of <i>Klebsiella</i> so monitor for chronic infection and cull if necessary. <i>Staph/strep</i>: Cloxacillin or amoxicillin intramammary treatments should have reasonable action unless culture and sensitivity suggests otherwise. Treat until clinical signs resolved or somatic cell count normal. 2-3 days often enough. <i>Staph aureus</i> may require up to 8 days and can become a chronic infection. - Potentially systemic treatment if multiple quarters affected or systemic signs: trimethoprim/sulphonamide, tylosin.

Diagnostics:

Patient side tests like the California milk test can detect mastitis. Somatic cell counts can be conducted in the lab. Gold standard is to take a sterile milk sample for culture and sensitivity before antibiotics are prescribed- Sample can be frozen to wait for response to treatment before submission. Recurrent symptoms should always be cultured. Sensitivity testing can be less accurate due to lack of breakpoints for intramammary treatments.

Taking a sterile milk sample for culture:

Wear gloves, brush debris off udder using water if needed. Predip teat with iodine and leave for 30 seconds then dry with paper towel. Wipe teats with isopropyl alcohol.

Strip teat 5 times, discarding the milk then wipe again with alcohol.

Strip teat 4 times into a sterile collection pot and label with date and quarter. Place into a cooler on ice packs and transport to lab within 24 hours.

Control and Prevention:

Hygienic milking practices essential- clean hands/equipment and environment. Leave cows to stand after milking before returning to pasture. Identify cows with recurrent mastitis to cull out of herd. Check new purchases to prevent introduction of mastitis to herd.

Regularly conduct somatic cell counts or California milk tests to identify subclinical cases.

Reproductive Disorders



CATTLE

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Metritis <i>E-coli, Trueperella pyogenes, Fusobacterium necrophorum, Prevotella spp., Bacteroides spp.</i>	Discharge from the uterus- red brown watery to purulent. Smelly. Enlarged uterus. Can also see systemic signs- fever, inappetence, depression. Usually occurs in first 21 days after calving.	Diagnosis is from clinical signs and examination	- Antibiotics only if systemically ill. - Procaine penicillin or oxytetracycline for 3-5 days. - Fluids and non-steroidal anti-inflammatories also needed. - Administration of medications or antiseptics into the uterus is not recommended. Hormone therapies have shown little benefit.	- Reduce trauma at calving. - Ensure clean hands and equipment when assisting with calving. - Often accompanied by retained foetal membranes.
Endometritis <i>Trueperella Pyogenes</i>	May have discharge from vulva 'whites'. Failure to show heat, failure to get pregnant.	Clinical signs Manual examination of vagina. Ultrasound- detection of pus in uterus. Uterine cytology gold standard.	- Self cure rate without treatment is high. Intrauterine antiseptics are not recommended. - Some evidence for the use of prostaglandins.	Risk factors for endometritis include dystocia, twins, stillbirths, metritis, abortion or ketosis.
Brucellosis <i>Brucella abortus</i>	Abortion (usually only once), stillborn/weak calves, retained placenta, reduced milk production. 'abortion storms'. Testicular abscesses, arthritis.	Clinical signs Serology Culture from placenta, udder, tissue samples from aborted calves.	- No treatment is practical. - Infected cattle become carriers and can spread the infection.	- Zoonotic. Notifiable disease - Vaccination of young cows before breeding can help control infections. - Isolate and segregate positive reactor, stop breeding
Leptospirosis <i>Leptospira spp.</i>	Abortions, weak calves, mastitis. Chronic infection - reproductive failure, embryo loss	Bacterial culture Serology PCR	Streptomycin single dose or oxytetracycline effective.	Vaccination is the best control method. Environmental and management factors including cleanliness and avoiding access to waterlogged pasture recommended.

Handwritten signature

Handwritten signature

Handwritten signature

Neurological Diseases



CATTLE & BUFFALO

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Listeria <i>Listeria Monocytogenes</i>	Reduced appetite, depression, disorientation, circling, facial paralysis, salivation. Abortion.	Clinical signs- asymmetrical neurological signs. Bacterial culture- brain tissue, aborted placenta/foetus. Immunofluorescence assay test (IFAT)	- Procaine penicillin or oxytetracycline intravenously every 12 hours for 1-2 weeks. - Supportive care.	- Zoonotic risk. - Control the quality of silage fed to the cattle.
Thromboembolic Meningoencephalitis <i>Histophilus somni</i>	Fever, depression, ataxia, recumbency. Opisthotonus, nystagmus, blindness, convulsions. Abortion.	Clinical signs - pneumonia generally also present in herd at same time as neurological signs. Gross and microscopic exam, isolation of lesion. PCR.	- Intravenous oxytetracycline twice a day for 5- 7 days. - Other options are penicillin, florfenicol or amoxicillin. - Poor recovery rate.	Vaccination, best given at weaning- not effective in an outbreak.
Otitis Media <i>Mycoplasma spp.</i> <i>Haemophilus, Pasteurella, Mannheimia, Streptococcus.</i>	Purulent ear discharge, epiphora, eyelid paralysis, head tilt, ataxia, paresis of pinna, strabismus, convulsions, concurrent pneumonia.	Clinical signs Culture Radiographs ELISA/PCR	- Oxytetracycline or florfenicol or tilmicosin or tulathromycin. 5-7 days of treatment.	- Biosecurity and quarantine of new or high risk animals. - Vaccination has debatable efficacy.
Meningitis <i>E-coli, Enterobacter, Salmonella</i>	Often follow diarrhoea and sepsis. Depressed, loss of suckle, stiff neck, tremor, convulsions, coma, evidence of septic process (joint, navel ill)	Clinical signs CSF evaluation	- Poor response to treatment, euthanasia generally advised. - Intensive nursing required. - Amoxicillin every 12 hours or Trimethoprim/Sulphonamide or Oxytetracycline every 24 hours. 10 days treatment,	- Good hygiene around calving. - Ensure adequate colostrum. - Rapid treatment of septic or potentially septic conditions.

Handwritten signature

Handwritten signature

Handwritten signature

Gastrointestinal



CATTLE & BUFFALO

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Traumatic Reticuloperitonitis <i>Gastrointestinal flora, Trueperella pyogenes</i>	Fever, reduced rumen sounds, drop in milk production, abdominal pain (arched back, reluctance to move). Pleuritis/Pericarditis- depression, high heart rate and respiratory rate. Muffled heart sounds, jugular distention, oedema and heart murmur	Clinical exam - xiphoid test (grunting when force applied to xiphoid), peritoneal fluid analysis. Ultrasonography.	- For uncomplicated cases: conservative treatment with rumen magnet and oxytetracycline or trimethoprim/sulphonamide daily for 5-7 days. - Non-steroidal anti-inflammatory. - If no resolution then surgery and rumenotomy to remove foreign object and drain abscesses can be attempted. - Prognosis poor so only suggested for high value animals	Pasture and housing management to avoid ingestion of metallic foreign bodies (e.g. wire)
Actinobacillosis/ Wooden Tongue <i>Actinobacillus lignieresii</i>	Firm swelling of tongue, difficulty eating, salivation and protrusion of the tongue.	Oral examination.	- Combination of oxytetracycline long acting- 2 injections 3 days apart PLUS - Sodium iodide given intravenously or subcutaneously at the same time as oxytetracycline.	Rough feed causes abrasions for bacteria to enter oral cavity.
Actinomycosis/ Lumpy Jaw <i>Actinomyces bovis</i>	Swelling of the upper or lower jaw with or without ulceration of the overlying skin with draining tracts 'honeycomb' appearance.	Oral examination.	- Combination of oxytetracycline long acting- 2 injections 3 days apart PLUS - Sodium iodide given intravenously or subcutaneously and repeated after 10 days. - Extensive bony involvement reduces chance of cure and immediate slaughter is appropriate.	Rough feed causes abrasion for the bacteria to enter.
Enteritis (Adults) <i>Parasites, Salmonella, Yersiniosis, BVD, monensin toxicity, ruminal acidosis</i>	Acute diarrhoea	Culture and sensitivity testing recommended- take a faecal sample. Postmortem Culture of tissues Histopathology	- Only treat with antibiotics if septic or salmonella confirmed. - Oral rehydration often sufficient for most cases. - Trimethoprim/sulphonamide daily until resolution of signs or oxytetracycline 2 doses 48 hours apart. - Multi drug resistant salmonella is present and culture is required to guide treatment.	- Reduce parasitism and other stressors. - Improved husbandry Isolating clinical cases

Handwritten signature

Handwritten signature

Handwritten signature

Miscellaneous Diseases



CATTLE & BUFFALO

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Rain scald/ Dermatophilosis <i>Dermatophilus congolensis</i>	Pustules, matting of hair, exudate. Scabs. Painful to remove and typically along the backbone.	Clinical exam Cytology of skin scrapes Culture	- Mostly self limiting and needs no treatment. - If severe then removal of crusts and disinfection with iodine. - Systemic antimicrobials rarely needed or advised but if extensive lesions then procaine penicillin for 3 days or a single long acting oxytetracycline injection sufficient.	Control of flies.
Tuberculosis <i>Mycobacterium bovis</i>	Loss of condition, recurrent fever, weak, loss of appetite, swollen lymph nodes, cough, chronic mastitis.	Intradermal tuberculin test. Culture (difficult and long)	No treatment practical or recommended.	- Affected animals should be culled. - Zoonotic disease. - Notifiable disease
Pinkeye <i>Moraxella bovis</i> , <i>Listeria</i> , <i>Mycoplasmas</i>	Corneal ulceration and swelling, blepharospasm, excessive tears.	Clinical exam.	- Cloxacillin eye ointment. - Subconjunctival injection of 2mls procaine penicillin (2 doses, 72 hours apart) - Systemic antibiotics if severe and bilateral or where topical treatment not possible: oxytetracycline and non-steroidal anti-inflammatories.	- Control of flies and dust/rough pasture. - Isolation of affected animals - Vaccination is possible.
Wounds and Abscesses <i>Trueperella pyogenes</i>	Large swelling, may be associated with lameness. Generally no systemic signs- fever or inappetence.	Palpation of mass or aspiration with a needle.	- Main treatment involves drainage and flushing. - Lance abscess at lowest point with a scalpel to allow drainage then flush with a dilute chlorhexidine or iodine solution. - Antibiotics rarely required unless systemic illness (fever), cellulitis or multiple abscesses that cannot be drained. - A suitable choice is oxytetracycline, 2 doses 48 hours apart.	- Hygiene - Maintain environment to reduce injury. - Ensure clean technique when injecting.
Lumpy Skin Disease <i>Lumpy skin disease virus</i>	Fever, nasal and ocular discharge, hypersalivation, nodules on skin and mucosa. Lymph nodes enlarged. Loss of condition and milk yield.	Histopathology, virus isolation or PCR.	- Distinguish from other causes of skin lumps. - Antibiotics only needed if secondary infections present. Supportive care- nursing and NSAIDs for pain.	- Notifiable disease - Vaccinations can help control.

Vector-borne Diseases



CATTLE & BUFFALO

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Redwater <i>Babesia spp.</i>	Fever, diarrhoea then constipation, red urine, anaemia, jaundice, dyspnea , tachycardia, abortion. Death rarely.	Clinical signs. Blood smear can show the parasite. Serology.	- Imidocarb or Diminazine aceturate. Imidocarb can also be used for prevention. - Supportive care including fluids, NSAIDs, blood transfusions.	Tick control.
Theileriosis <i>Theileria spp.</i>	Fever, lymph node swelling, dyspnoea and high mortality. Anorexia. Large amounts of nasal discharge before death.	Clinical signs Post-mortem- lymph node enlargement, pulmonary oedema, haemorrhages on serosa/mucosa Parasites visible in lymph node samples	- Buparvaquone is effective in early stages of the disease. - NSAIDs and supportive care. - Treat pulmonary oedema if present.	Tick control
Anaplasmosis <i>Anaplasma spp.</i>	Severe and fatal in older cattle. Anaemia. Inappetence, loss of co-ordination, tachycardia, milk production falls, abortion, fever.	Clinical signs Blood smears Serology.	- Tetracyclines e.g. oxytetracycline LA effective in early stages for acute disease. - Carrier state may require 2 or more injections of oxytetracycline LA. - Imidocarb also effective against some species, carrier state requires multiple injections at higher dose.	Tick control.
Ephemeral fever <i>Bovine ephemeral fever virus</i>	Fever, shivering, inappetence, nasal discharge, drooling, dyspnoea, tachycardia, stiffness/lameness, decrease in milk yield. Recumbancy	Clinical signs in an epidemic are diagnostic. PCR confirmation possible.	- Supportive care only. Most animals will recover spontaneously in a few days. - NSAIDs and rest are essential for treatment. - Treat clinical signs of hypocalcaemia. - Fluid therapy. - Antibiotics only indicated if obvious secondary infection.	Infection causes long term immunity. Mortality is low. Spread by <i>Culicoides</i> and other mosquito species.

Handwritten signature

Handwritten signature

Handwritten signature

Antibiotics



CATTLE & BUFFALO

ANTIBIOTIC	DOSE	WITHDRAWAL PERIOD		CONTRAINDICATIONS/ WARNINGS
		MEAT	MILK	
Amoxicillin	7mg/kg	28 days	48 hours	
Erythromycin	2-4mg/kg	14 days	72 hours	
Procaine penicillin	12mg/kg	5 days	36 hours	Note: recommended doses are up to 22mg/kg but withholding periods have not been determined for this off licence dose.
Oxytetracycline short acting	10mg/kg	14 days	5 days	
Oxytetracycline long acting	20mg/kg	28 days	7 days	
Trimethoprim/sulphonamide	24mg/kg	28 days	3 days	
Florfenicol	40mg/kg	55 days	DNU	Not in lactating cattle
	20mg/kg	36 days	DNU	Not in lactating cattle
Tulathromycin	2.5mg/kg	25 days	DNU	Not in lactating cattle
Streptomycin	10mg/kg	16 days	48 hours	
Tilmicosin	10mg/kg	28 days	DNU	Not in lactating cattle
Tylosin	5-10mg/kg	21 days	72 hours	

Withdrawal period is product specific so review label to confirm. Some recommendations may represent 'off-licence' doses. DNU= Do not use

Dosing Guidance



CATTLE & BUFFALO

Weight Estimation

WEIGHT in KG = Length (Cm) x Heart Girth (Cm) x Heart Girth (Cm)

10830

1. **Length:** From the point of shoulder to the pin bone of hip
2. **Girth:** Around chest just behind the forelimbs

e.g. if Length = 150cm and Girth = 120cm then Weight = $150 \times 120 \times 120 / 10830 = 199.4\text{kg}$

Calculating Doses

WEIGHT (Kg) x DOSE OF DRUG (mg/kg)

CONCENTRATION OF DRUG (mg/ml)

e.g. if Oxytetracycline is 200mg/ml and the dose is 20mg/kg for a 400kg cow the dose would be:

$400 \times 20 / 200 = 40\text{mls}$

Handwritten signature

Handwritten signature

Handwritten signature

Antimicrobial Use Guidelines



CATTLE & BUFFALO

Use

Amoxicillin
Oxytetracycline
Streptopenicillin
Benzathine penicillin
Procaine penicillin
Erythromycin

Think

Trimethoprim/Sulphonamides
Tylosin
Florfenicol

Stop

Gentamicin
3rd generation Cephalosporins
Fluroquinolones

BLACK (CRITICAL) - DO NOT USE FOR ANY REASON:

4th generation Cephalosporins, Colistin, Amikacin,
Chloramphenicol, Metronidazole

KEY:

Green: Use these antibiotics as a 1st choice option

Yellow: If a green option is not suitable then these are 2nd choice options

Red: Only use after culture and sensitivity testing, if no other option is available.

Lameness



SHEEP GOATS

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Foot and Mouth Disease <i>Foot and mouth disease virus</i>	Lameness, depression, wont stand, blisters/lesions at top of foot, between claws, tongue and dental pad. Fever. Lambs may die.	Suspicious clinical signs should be reported and samples collected. ELISA and PCR available	- Supportive treatment only. Boric acid and alum antiseptic in affected area. - Treatment of secondary infection should involve a first-line broad spectrum antibiotic such as oxytetracycline. - Non-steroidal anti-inflammatories can be given for pain.	- Vaccination available - Restriction of movement for infected animals - Notifiable disease
Scald/Footrot <i>Dichelobacter nodosus</i>	Scald- redness between toes and lameness, no smell or damage to hoof. Foot rot- lameness, foul smell, damage between toes, to heel, sole and walls of hoof	Diagnosis from clinical signs only	- Scald: use a zinc sulphate footbath at 10% concentration, antibiotics not required. - Footrot: 2 doses of oxytetracycline LA, 3 days apart. Erythromycin also option. Start foot- bathing protocol. - NSAIDs for pain	- Regular footbaths with 10% Zinc Sulphate, let dry for hours after. - Culling affected animals - Quarantine and inspect new arrivals. Vaccination, Notifiable disease
Strawberry Footrot <i>Dermatophilus congolensis</i>	Scabs and hair loss from claw to hock/knee. Swelling and lameness or reluctance to move. Bleeding fleshy mass present under scab.	Diagnosis from clinical signs only	Either: Oxytetracycline LA 2 doses 72 hours apart OR Erythromycin for short withdrawal period. NSAIDs for pain	- Move sheep into a dry pasture. - Footbathing with 10% Zinc sulphate to control spread and help healing.
Foot Abscess	Acute lameness, reluctance to move. Swelling of one claw, discharge upon drainage.	Diagnosis from clinical signs only	- Antibiotics are not required. - NSAID for pain, especially pregnant ewes. Establish drainage of the abscess and flush. Observe any open wounds for fly strike.	- Move sheep to drier pasture. Avoid fat ewes and wet pasture. - Control dermatitis with foot baths Avoid overgrown claws.

Handwritten signature

Handwritten signature

Handwritten signature

Skin Diseases



SHEEP GOATS

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Wounds/Flystrike <i>Assorted bacteria</i>	Examine wound carefully to determine what areas are affected. Determine if maggots present.	Diagnosed based on clinical signs.	- Clip fleece, flush the wound with clean water or dilute iodine. Remove contamination and debride dead/infected tissue. - Give NSAID. Antibiotics only needed if wound deep or affects joints/body cavities- oxytetracycline or penicillin. - Treat flystrike with insecticide preparation.	Check sheep carefully for fly strike, apply treatment if needed.
Lumpy Wool <i>Dermatophilus congolensis</i>	Hard scab masses lifting from skin.	Clinical signs usually sufficient but can perform cytology on smears of skin.	Most older sheep will spontaneously recover without antibiotics, some recover after shearing of wool. Check carefully for fly- strike. Oxytetracycline or erythromycin treatment then shearing of wool once scabs lift (approx. 4 weeks later).	Prevent sheep sitting with wet wool- shearing before rainy season. Shear affected sheep last. Cull sheep that don't respond to treatment. Zinc sulphate (0.5%) sheep dips.
Malignant Oedema <i>Clostridium septicum</i>	Depression, lameness, swelling, oedema (pitting when pressed with a finger), crepitus around wounds/injection sites, shock and death.	Clinical signs. Aspirate fluid from affected areas and see gram-positive rods on cytology. Post-mortem: tissue wet and dark brown exudate under skin	- Procaine penicillin (erythromycin, oxytetracycline) - Surgical drainage of affected area - Fluids and NSAIDs	Clostridial vaccines can prevent disease. Avoid shearing cuts or fighting and handle animals carefully.
Sheep and Goat Pox <i>Capripoxviruses</i>	Fever, spots/blisters on skin, nose, mouth or body. Depression, inappetence, lesions on tongue, discharge from nose/eyes, swollen eyelids, breathing difficulties, death.	Clinical signs Serology and PCR	- Supportive treatment only- NSAIDs, fly-strike control - Isolate sick herds for at least 45 days after recovery. - Clean and disinfect premises - Slaughter of infected herds.	- Vaccines exist for control and prevention. - Quarantine of new animals. - Notifiable disease.

Respiratory Diseases



SHEEP GOATS

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Pneumonia <i>Mannheimia haemolytica</i> and <i>Pasteurella</i>	Rapid breathing, nasal discharge, coughing, respiratory distress, weight loss, low appetite.	Clinical signs usually enough but during an outbreak take samples from post-mortem for culture and AST.	Oxytetracycline LA, use until resolved in severe cases.	- Avoid overcrowding and dusty environments. - Reduce stress and practice gentle handling.
Peste des petits ruminants <i>Morbillivirus</i>	Fever, depression, inappetence, nasal discharge, bad odour to mouth, crusty eyes, stomatitis of the mouth, diarrhoea, pneumonia, coughing. Abortion.	Presume diagnosis based on clinical signs but take bloods for serology or samples for PCR.	Supportive treatment only. NSAIDs for pain.	- Notifiable disease - Routine vaccination
Contagious caprine pleuropneumonia <i>Mycoplasma capricolum</i> <i>capripneumoniae</i>	Fever, lethargy, coughing, difficulty breathing, frothy nasal discharge, poor appetite. Acute death	ELISA - serology Post-mortem samples for culture	Antibiotic options: Oxytetracycline OR Tylosin OR Tiamulin	- Notifiable disease - Vaccine available.
Bluetongue <i>Bluetongue virus</i>	Ulcers in mouth, discharge from eyes/nose, drooling, swelling of lips, tongue, head, neck, coronary band. Fever, lameness, breathing problems, death, abortion. Lambs stillborn or deformed, weak or die soon after birth.	Suspicious clinical signs should be investigated. Post-mortem, bloods for serological testing, PCR.	- Supportive treatment only - rest, soft food, good husbandry. - NSAIDs for oral pain.	Vaccine depends on serotype present. Control of vectors - spread by <i>Culicoides</i> midges.

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

Acute death



SHEEP GOATS

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Anthrax <i>Bacillus anthracis</i>	Staggering, difficulty breathing, collapse and death after convulsion. Fever and sudden death. Bloody discharge from body openings.	If suspicious clinical signs, Post mortem in the field should not be conducted. Do not open carcass. Rigor mortis often absent. Cotton swab dipped in blood and left to dry then submitted to lab.	• Penicillin or oxytetracycline (twice daily) used in early stages of the disease. • Once severe symptoms treatment likely useless. • Ensure careful disposal of carcasses by burning or deep burial and lime advised.	• Notifiable disease • Vaccination for animals in endemic areas. Zoonotic.
Salmonellosis <i>Salmonella enterica</i>	Diarrhoea and systemic illness, rapid death. Depression, fever. Spontaneous abortion. Anorexia and dehydration.	Clinical signs and culture and AST of faecal samples.	• Isolate infected animals. • Treat with trimethoprim-sulphonamide or neomycin (unless otherwise indicated by culture and sensitivity testing, resistance can be a problem). • Give fluids- oral electrolyte solutions or intravenous.	• Zoonotic • Good hygiene of housing and feed areas. Reduce stress and stocking density. • Provide good nutrition, • Ensure no access to feed by vermin.
Pasteurellosis <i>Pasteurella multocida</i>	Lambs often found dead. Depression, nasal discharge, diarrhoea, nasal discharge, fever, anorexia	Clinical signs. Post-mortem - pneumonitis, Culture or PCR.	• Oxytetracycline LA or tilmicosin or sulphonamides . • Supportive treatment with NSAIDs and fluids. Early treatment essential.	• Avoid stressors, Vaccination, Avoid overcrowding, poor ventilation and prolonged transportation.
Enterotoxaemia (pulpy kidney) <i>Clostridium perfringens</i> C/D	Sudden death, swollen belly/abdominal pain, depression, neurological signs, seizures, inappetence, weak or recumbent.	Clinical signs. Post-mortem dead sheep- enlargement and change in appearance of kidneys, fluid filled pericardium, Urine test for glycosuria.	• Penicillin • Supportive treatment for pain (NSAID), fluids, antitoxin if available.	• Risk factor is overeating in young lambs- control feed. • Vaccination for clostridial disease protective.

Handwritten signature/initials.

Handwritten signature/initials.

Handwritten signature/initials.

Reproductive Diseases



SHEEP GOATS

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Abortion <i>Campylobacter fetus</i> , <i>C. jejuni</i> , <i>Toxoplasma gondii</i> , <i>Listeria</i> , <i>Yersinia</i>	Passing of dead fetus and foetal membranes.	Collect foetal tissue and placenta for culture and AST.	- Remove aborted ewes from the flock and turn out the remaining ewes into a clean pasture. Disinfection of sheds and equipment. - Need to identify specific cause.	Potential zoonotic agents- hand hygiene and gloves when handling tissue important.
Septic Metritis	Uterine discharge, fever, depression, inappetence. More common after abortion or lambing intervention.	Clinical signs enough for diagnosis.	- Only use antibiotics if systemically unwell- e.g. fever and depression. - Oxytetracycline LA and NSAIDs advised.	Hygiene important if assisting with lambing- clean hands and clean environment.
Vaginal Prolapse	Smooth red mass from vulva, often in last month of pregnancy. May become swollen, purple, black or cold.	Clinical signs enough for diagnosis	- Differentiate from rectal prolapse. - Clean with water or dilute iodine, cover with lubricant and replace gently. - Keep in place with vulvar stitch or harness. - Antibiotics only if severe damage or contamination- oxytetracycline for 3 days.	- Prevent ewes becoming overfat and ensure that tail docking is carried out at the correct length. - Genetic predisposition to prolapse.
Uterine Prolapse	Large mass hanging down from vulva covered in raised circular areas (carbuncles) from placental attachment.	Clinical signs enough for diagnosis.	Epidural anaesthetic to allow easy replacement. Clean with water or dilute betadine and cover with lubricant to replace. NSAID for pain and inflammation. Antibiotics only if tissue damage or contamination- oxytetracycline for 3 days.	- Identify any ewes having dystocia and promptly assist. Ensure not too much traction used during assistance. - Ensure dietary calcium provision enough.
Brucellosis/ Epididymitis <i>Brucella melitensis/Ovis</i>	Lesions palpated in epididymis and scrotal tunic. Epididymal enlargement, thickened tunic. Doe/Ewes may abort.	Clinical examination, microbial culture of semen. Serological tests.	- No treatment is economically viable- cull infected animals to prevent spread. - Replace buck/rams from a flock free from <i>Brucella</i>	- Examine buck/rams before breeding and cull those that have abnormalities to their genitals. - Buy stock from flocks free from <i>Brucella</i>. Notifiable disease.

Handwritten signature

Handwritten signature

Handwritten signature

Miscellaneous Diseases



SHEEP GOATS

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Listeria <i>Listeria monocytogenes</i>	Head tilt, drooping ear/lip, deviation of nose, circling.	Diagnosed on clinical signs	- Procaine penicillin or oxytetracycline IM twice a day for 5-7 days. - Prognosis poor unless early and aggressive treatment	Zoonotic
Tetanus <i>Clostridium tetani</i>	Stiff gait, saw-horse stance, erect ears, noise worsens symptoms.	Diagnosed on clinical signs	- Prognosis hopeless so antibiotic treatment not recommended. - Euthanasia is recommended.	- Hygiene at marking - Vaccinate ewes and lambs with clostridia vaccine if available
Pink eye <i>Chlamydia pecorum</i> , <i>Mycoplasma conjunctivae</i> and <i>Moraxella ovis</i>	Often flock outbreak. Blinking, tearing of eye, red and inflamed, eye cloudy or opaque. Ulcers may develop.	Diagnosed on clinical signs only.	- Many will recover without any treatment. Oxytetracycline LA OR Cloxacillin topically for <i>M. ovis</i> - One application usually enough, repeat after 48 hours if needed.	Quarantine new stock to ensure not infected but animals may be carriers of infection.
Caseous Lymphadenitis <i>Corynebacterium pseudotuberculosis</i>	Abscesses of lymph nodes, weight loss, ill-thrift	Diagnosed on obvious lesions: lymph nodes with thick, non-smelly pus. Culture for corynebacterium is definitive.	No antibiotics should be used- does not respond to treatment.	- Eradication of infected stock from herd, decontamination of environment (bleach or chlorhexidine). - Vaccination if available. - Disinfection of equipment Zoonotic
Gangrenous Mastitis <i>Staph aureus</i> , <i>mannheimia spp.</i>	Severe mastitis with rapid onset. Udder enlarged, hot and painful, then black and cold. Ewe lame, inappetent and depressed.	Clinical signs for diagnosis and a sterile milk sample should be collected for culture and AST	- Oxytetracycline or penicillin intravenously for at least 3 days. - Intramammary not effective. NSAIDs (e.g. flunixin) and supportive treatment.	Ensure environmental cleanliness.

Handwritten signature

Handwritten signature

Lambs/Kids



SHEEP GOATS

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Umbilical Infection <i>Multiple bacteria</i>	Large painful umbilicus	Diagnosed on clinical signs only.	- Oxytetracycline or trimethoprim-sulphonamide, 7-10 days duration. - Drainage of abscesses and surgical resection of infected tissues.	- Ensure good hygiene at lambing- iodine treatment of navals. - Ensure lambs consume adequate colostrum.
Infectious Arthritis <i>Multiple bacteria</i>	Swollen, hot, painful joints. Lameness Often soon after birth or after marking/shearing	Diagnosed on clinical signs. Joint fluid can be aspirated and sent for culture and AST.	- Procaine penicillin or oxytetracycline. - Joint damage often irreversible and animals permanently lame and unproductive.	- Ensure good hygiene at lambing- iodine treatment of navals. - Ensure lambs consume adequate colostrum.
Diarrhoea <i>E-coli, Coccidiosis, Salmonella, Campylobacter, Rotavirus, Nematodirus</i>	Diarrhoea, collapse, dehydration, death.	Culture and AST for bacterial causes. Faecal exam for coccidiosis Post-mortem will help identify coccidiosis lesions.	- Coccidiosis: Sulphonamide or toltrazuril. Antibiotics not indicated for treatment unless culture positive for bacteria or signs of sepsis. 5 days of Trimethoprim-sulphonamide, neomycin or oxytetracycline, or based on culture and AST.	Hygiene important, ensure adequate nutrition, avoid overcrowding, ensure sufficient colostrum.
Orf <i>Parapoxvirus</i>	Crusts and scabs around mouth and nose. Occasionally spread to teats or lead to strawberry footrot.	Clinical signs sufficient for diagnosis. Often outbreaks in the flock.	- Cases rarely need antibiotics- monitor for secondary infections e.g. mastitis, footrot etc. - Oxytetracycline LA only if absolutely needed.	- Zoonotic - Disinfect housing and equipment thoroughly, isolate infected stock, vaccines if available
E-coli (Watery Mouth) <i>E-coli</i>	Dull lamb, salivating profusely, not feeding, collapse, diarrhoea, death quickly follows. Often 1-4 days old.	Culture and sensitivity testing may be required as resistance of E-coli to antibiotics present. Clinical signs sufficient for diagnosis.	- Prevention preferable. - Electrolyte solution by stomach tube, warming. Start colostrum only when warm. - Amoxicillin may be a suitable choice or trimethoprim-sulphonamide.	Ensure lambs receive good colostrum shortly after birth- ewe needs enough nutrition. Ensure clean environment for lambing, Don't use rubber bands for docking/castration within 24 hours of birth.

Handwritten signature

Handwritten signature

Handwritten signature

Antibiotics



SHEEP GOATS

ANTIBIOTIC	DOSE	WITHDRAWAL PERIOD		CONTRAINDICATIONS/ WARNINGS
		MEAT	MILK	
Amoxicillin short acting	7mg/kg	28 days	3 days	Check packet to confirm withdrawal for milk.
Amoxicillin long acting	15mg/kg	28 days	3 days	
Procaine penicillin	22,000IU/kg	10 days	4 days	
Oxytetracycline short acting	10mg/kg	5 days	14 days	IV or IM injection
Oxytetracycline long acting	20mg/kg	28 days	7 days	IM injection
Trimethoprim/sulphonamide	24mg/kg	28 days	3 days	Check packet to confirm withdrawal for milk.
Erythromycin	2-5mg/kg	3 days		Check packet to confirm withdrawal for milk. Deep IM injection
Tilmicosin	10mg/kg	42 days	18 days	Do not treat lambs less than 15kg , single subcutaneous injection only. Calculate dose carefully.
Tylosin	10mg/kg	42 days	5 days	Do not give IV. No more than 5 days.
Florfenicol	20mg/kg	39 days	DNU	Do not use in breeding rams or lambs under 7 weeks.
Neomycin	4mg/kg	3 days	DNU	Orally for enteric disease as poor absorption from GI tract.

Withdrawal period is product specific so review label to confirm. Some recommendations may represent 'off-licence' doses. DNU= Do not use

NEPAL VETERINARY ANTIMICROBIAL TREATMENT GUIDELINES

Handwritten signature

Handwritten signature

Handwritten signature

Antimicrobial Use Guidelines



**SHEEP
GOATS**

Use

Procaine penicillin
Erythromycin
Oxytetracycline
Amoxicillin
Tiamulin
Neomycin

Think

Trimethoprim-Sulphonamide
Tylosin
Florphenicol
Cloxacillin

Stop

Ceftiofur
Virginiamycin
Fluroquinolones- enrofloxacin
Gentamicin

BLACK (CRITICAL) - DO NOT USE FOR ANY REASON:
4th generation Cephalosporins, Colistin,
Amikacin, Chloramphenicol, Metronidazole.

KEY:

Green: Use these antibiotics as a 1st choice option

Yellow: If a green option is not suitable then these are 2nd choice options

Red: Only use after culture and sensitivity testing, if no other option is available.

Skin Diseases



PIGS

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Erysipelas <i>Erysipelothrix rhusiopathiae</i>	Diamond shaped skin lesions, lameness, lack of appetite, depression, fever, abortion.	Diagnosed on clinical signs. Post-mortem: widespread vascular lesions and microthrombi. Culture of lesions with AST	• Penicillin twice a day for 3 days. Tylosin is an alternative. • NSAIDs for fever and pain.	• Zoonotic • Vaccination. • Ensure good hygiene of environment and cull animals with chronic infections.
Exudative Epidermitis <i>Staphylococcus hyicus</i>	Redness of skin, to red-brown spots exuding serum and crusty.	Diagnosed on clinical signs. Culture of lesions with AST	• Topical- 0.05% chlorhexidine applied to entire body surface. • Isolate infected animals. • Procaine penicillin or trimethoprim-sulphonamide once a day for 3 days.	• Environmental improvements- ventilation, clean, dry pens, reduced stocking density.
Wounds <i>Multiple bacteria</i>	Examine wound to see what structures are damaged	Clinical signs enough, but sedation can be used for restraint.	• Clean and flush wound with clean water or dilute iodine. Remove debris and dead tissue. • NSAID- e.g. meloxicam • Antibiotics only needed if deep wound, joints or body cavities involved: oxytetracycline or penicillin	• Avoid fighting- reduce stocking density or competition for feed. • Check environment for possible causes of wounds.
Skin abrasions (piglets) <i>Streptococcus, staphylococcus, e-coli</i>	Abrasions over hocks, feet, penetrating wounds. Lameness and difficulty competing for food, leading to starvation and death.	Clinical signs sufficient, examine environment to find potential causes.	• Procaine penicillin	• Ensure adequate floor covering and avoid floor materials that are abrasive like concrete or wire.
Mange (Mite) dermatitis	Irritation, Skin rashes, thickened skin	Clinical signs sufficient, microscopic examination of skin lesion	• Topical use of Amitraz 12.4% 40 ml/10 l water or Amitraz 2% pour on to skin, • Ivermectin 1% 1 ml/33 kg	• Environmental improvement, dry pens,

Lameness



PIGS

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Foot and Mouth Disease <i>Foot and mouth disease virus</i>	Lameness, salivation, blisters/vesicles on claws, nose, tongue, lips, inappetence, depression, fever, abortion, death. Increased piglet mortality.	Serological testing Samples of blisters/vesicular fluid.	- Supportive treatment only. - Treatment of secondary infection should involve a first-line broad spectrum antibiotic such as oxytetracycline. - Non-steroidal anti-inflammatories can be given for pain.	- Notifiable disease - Vaccination and biosecurity are the best defences.
Joint ill <i>Streptococcus, Staphylococcus, Haemophilus parasuis</i>	Signs of arthritis of one or more joints. Often following teeth clipping, tail docking or umbilical infection.	Clinical signs often enough to diagnose. Joint fluid can be aspirated for culture and AST	- Amoxicillin- often needs an extended course and prognosis can be poor. - NSAIDs should be given for pain management.	Hygiene around farrowing and management procedures.
Mycoplasma arthritis <i>Mycoplasma hyosynoviae</i>	Lameness, swollen joints, lying down and reluctant to stand or walk.	Clinical signs sufficient to diagnose.	Oxytetracycline or tylosin. NSAIDs for pain management.	- Improve ventilation and air quality, ensure correct stocking density. - Hygiene of housing and environment
Polyserositis/ Glasser's disease <i>(Haemophilus Glaesserella parasuis)</i> <i>Mycoplasma hyorhinis</i>	Sudden onset in young pigs 4-8 weeks. Fever, coughing, abdominal breathing, failure to thrive, arthritis, swollen joints, meningitis, sudden death	Post-mortem reveals fibrinous exudate on serosa. Bacterial culture	- Parenteral treatment preferred for individual pigs- penicillin, amoxicillin (for haemophilus, streptococcus) or tylosin (for mycoplasma) are options. - Herd level treatment with amoxicillin in water can be used for outbreaks. - NSAIDs advised for pain management	- Isolate affected animals. - Vaccines available for some agents. - Use disinfectants in housing and equipment like aldehyde, hypochlorite, iodine, etc.

np. 1/1

1/1

1/1

Reproductive Diseases



PIGS

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Mastitis, Metritis and Agalactia <i>E-coli, Staphylococcus, Streptococcus</i>	First few days after farrowing. Mastitis +/- metritis (discharge from vulva). Loss of appetite for 1-2 days, depression, reluctance to stand, hungry piglets, weight loss.	Diagnosed on clinical signs. Mastitis test	• NSAID injection e.g. flunixin • Oxytocin injection • Oxytetracycline SA once daily for 3-5 days Ensure adequate water and feed provision.	• Hygiene at farrowing- clean, dry environment. Removal of faecal material. Hygiene if assisting with farrowing- clean hands and wash vulva with chlorhexidine. Fat sows more predisposed. • Ensure adequate water and feed. • Exercise to the sows before farrowing. • Avoid slippery floor

Abortion

Causes:

- **Toxic:** mycotoxins, cresol sprays, dicumarol, carbon dioxide toxicity
- **Viral:** porcine reproductive and respiratory syndrome virus, parvovirus, pseudorabies, classical swine fever, African swine fever, foot and mouth disease, swine influenza.
- **Bacterial:** brucella, leptospirosis, staphylococcus aureus, streptococcus spp., erysiplothrrix rhusiopathiae, salmonella spp, *Pasteurella multocida*, trueperella pyogenes, listeria monocytogenes, E-coli.

Diagnosis:

Samples of the placenta and aborted foetal tissues should be collected for culture/viral isolation. Bloods taken for serology. For some diseases, the cause of the abortion can be determined by clinical signs in the herd (e.g. foot and mouth disease, classical/African swine fever).

Treatment: Accurate diagnosis is needed to determine management for the rest of the herd. Leptospirosis and Brucella cannot be reliably cured with antibiotics. Do not use herd level antibiotics without a diagnosis.

Control and prevention:

Brucella, foot and mouth disease and is notifiable. Brucella and leptospirosis are zoonotic. Vaccinations exist for some of the diseases.

Handwritten signature

Handwritten signature

Handwritten signature

Miscellaneous Diseases



PIGS

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Classical swine fever <i>Classical swine fever virus</i>	Fever, lethargy, yellow diarrhoea, vomiting, haemorrhages, purple skin of ears, abdomen and legs. Abortion. Ataxia.	Post-mortem: haemorrhages in lymph nodes, tonsils, larynx, kidneys, spleen and bladder. Blood and tissue samples for serology and PCR.	Supportive treatment only. Antibiotics not generally required, NSAIDs can be used for fever.	- Notifiable disease - Vaccination is the best prevention strategy. - Samples important to differentiate from African swine fever.
African Swine Fever <i>African swine fever virus</i>	High fever, inappetence, recumbency, reddening/cyanosis of ears and snout. Bleeding from nose and anus. Abortion, dyspnoea and vomiting. Massive mortalities.	Post-mortem: haemorrhages predominantly in lymph nodes (look like blood clots), kidneys and heart. Spleen large and friable. Fluid in body cavities. Tissue and blood samples should be taken for lab testing,	- Eradication of infected stock is the only measure. - Ensure safe disposal of carcasses to limit spread.	- Notifiable disease - Eliminate contact with wild pigs, don't feed uncooked food waste.
Sudden death/Oedema disease <i>E-coli</i>	Diarrhoea, inappetence, swollen eyelids, ataxia, recumbency and death	Post-mortem: fluid filled bowel, oedema around stomach and colon. Take samples for culture and sensitivity testing.	Response to treatment often poor, culture and sensitivity is the best option if antibiotic treatment is planned. Better to look for root cause.	- Improve management of weaner pigs- reduce stress, ensure adequate ventilation, temperature, space and water/food provision. - Check hygiene.
Meningitis <i>Streptococcus suis</i> <i>Haemophilus parasuis</i>	Meningitis +/- septicaemia, arthritis, pneumonia, endocarditis, polyserositis. Fever, head pressing, reluctant to stand, fever. Paddling convulsions, nystagmus.	Clinical signs usually lead to presumed diagnosis Can do cytology on CSF fluid.	- Penicillin or Amoxicillin IM once daily for 3-5 days. - Supportive treatment- nursing care, soft bedding, fluids, NSAIDs.	Streptococcus suis can be zoonotic.
Aujeszky's disease <i>/Pseudorabies</i> <i>Herpesvirus</i>	High mortality, tremors, paddling, respiratory disease, sneezing, dyspnoea, weight loss, loss appetite.	Diagnosis suspected if seeing reproductive failure in sows and high mortality with neuro signs in piglets. Serology and PCR on tissue (brain, spleen and lung) and blood samples can confirm.	- No treatment for acute infection. Supportive care only. - Antibiotics only indicated if obvious secondary infection.	- Notifiable disease - Vaccination is very effective.

Handwritten signature

Handwritten signature

Handwritten signature

Diarrhoea



PIGS

POSSIBLE CAUSES

Newborn piglets

E-coli
Salmonella
Clostridium perfringens
Rotavirus (rarely fatal)

Pre-weaning

E-coli (enterotoxigenic- severe diarrhoea, dehydration, death)
Clostridium perfringens (acute, bloody diarrhoea, sudden death or yellow diarrhoea)

Post-weaning

E-coli most common in first few weeks post weaning
Salmonella
Lawsonia intracellularis (7-11 weeks age, diarrhoea, wasting and failure to thrive)
Brachyspira spp (>7 weeks of age, mucus and blood in diarrhoea)

DIAGNOSTICS

Post-mortem findings, take faecal sample to submit for culture and AST
PCR on faeces for *Lawsonia/Brachyspira*. Check for coccidia.

TREATMENT

Antibiotics not required for viral diarrhea like Porcine Epidemic Diarrhoea, .
Provide supportive treatment- electrolytes and glucose in water feeders or by stomach tube. Ensure warm creep area for young piglets.
Antibiotics indicated when culture positive for bacteria or pig is septic/systemically unwell
E-coli: Best practice is to base treatment on the culture and sensitivity results. Otherwise trimethoprim-sulphonamide or neomycin can be used.
L. Intracellularis: Tylosin, Tiamulin or oxytetracycline are options. Once daily for 3 days.
Brachyspira: Tiamulin
Coccidiosis: Toltrazil single dose or Trimethoprim-Sulphonamide

PREVENTION AND CONTROL

Hygiene of the farrowing area and housing very important- ensure bedding clean and dry and housing frequently disinfected. Ensure not overstocking and reduce stress. Vaccination possible for some agents.

Diarrhoea



PIGS

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT	CONTROL AND PREVENTION
Porcine Epidemic Diarrhoea (PED)	Affected to all age of pig but upto 100% mortality in neonatal or suckling piglets Watery Diarrhoea and vomition Agalactia in sow	Clinical signs and laboratory diagnosis	Supportive cares but No antibiotics except secondary infection	Vaccination, strict biosecurity is the most effective way to control
Transmissible Gastroenteritis (TGE)	More severe in pigs less than 3 weeks of age Fluid diarrhea for 1-2 days Vomition may occur followed by diarrhea Skin of the rump is always wet because of watery diarrhea Dehydration, shrunken eyes and rough hair coat Most die after 2-5 days of infection	Typical clinical signs	- No antibiotics needed if no secondary infection - Fluid therapy - Provision of water and heat for the pigs	- Isolation and quarantine. Mix the infected pigs with other pigs after 1 month of last clinical sign - Thorough cleaning and disinfection and maintaining warm temperature in the pen
Salmonellosis	Mostly seen in weaned pigs to 5 months of age pigs Reduced feed intake Liquid yellow feces with shreds of necrotic debris Diarrhoea last for 3-7 days	Culture of organism Clinical signs	Parenteral administration of antibiotics like neomycin and lincomycin	- Vaccination - Total cleaning and disinfection

Handwritten signature

Handwritten signature

Handwritten signature

Respiratory Diseases



PIGS

SYMPTOMS

Coughing, respiratory distress, open mouth breathing, sudden death

POSSIBLE CAUSES

Mycoplasma hyopneumoniae (Immunosuppressive, causes coughing)

Secondary bacterial infections with *Pasteurella multocida*, *Bordetella bronchiseptica*, *Streptococcus* and *Haemophilus parasuis*.

Porcine circovirus

Actinobacillus pleuropneumoniae

Salmonellosis

Consider involvement of ascarids and metastrongyles.

DIAGNOSTICS

Post-mortem findings confirm pneumonia and samples should be taken for culture and sensitivity, particularly for *Pasteurella multocida*. Look for evidence of migrating worms.

TREATMENT

Culture of mycoplasma often not possible so focus on treatment of secondary pathogens:

Injectable amoxicillin, penicillin or florfenicol can be used for individual pigs.

For simple mycoplasma infection of a herd without obvious secondary disease: tiamulin, tylosin or tetracycline in water for 3 days

Culture and sensitivity testing needed to guide treatment of *Pasteurella*.

For *Actinobacillus* - culture and sensitivity testing needed to guide antibiotic choice but amoxicillin, tilmicosin, florfenicol or tetracycline in water can be used.

For worms: levamisole or ivermectin.

Provide NSAIDs to affected pigs

PREVENTION AND CONTROL

Vaccination possible for some agents. Control ventilation and stocking density. Reduce stress and maintain good hygiene of the unit.

Antibiotics



PIGS

ANTIBIOTIC	ROUTE	DOSE	WITHDRAWAL PERIOD	CONTRAINDICATIONS/ WARNINGS
Amoxicillin	IM	7mg/kg SA 15mg/kg LA	14-28 days 28-30 days	
	Water	20mg/kg	14 days	
Ampicillin	I/M	2-7mg/kg	28 days	
Ceftiofur	I/M	3mg/kg	12 hours	
Erythromycin	IM	2-6mg/kg	7 days	
Procaine penicillin short acting	IM	12-15/kg	5 days	Higher doses up to 20mg/kg described but do not have withholding periods.
Oxytetracycline short acting	IM	4-9mg/kg	8-14 days	
Oxytetracycline long acting	IM	20-30mg/kg	28 days	
Trimethoprim/sulphonamide	Water	30mg/kg	8 days	In water
Florfenicol	Water	10mg/kg	12 days	Max 5 days treatment
	IM	15mg/kg	12-18 days	

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

Antibiotics



PIGS

ANTIBIOTIC	ROUTE	DOSE	WITHDRAWAL PERIOD	CONTRAINDICATIONS/ WARNINGS
Tilmicosin	Water	15-20mg/kg	7 days	
Tiamulin	Water	8.8-25.5mg/kg	5 days	Do not use at the same time as salinomycin or other ionophores
Tylosin	IM	5-10mg/kg	3 days	Do not exceed 3 days treatment
	Water	25mg/kg (Brachyspira) 6-12mg/kg (Lawsonia)		
Neomycin	IM	4mg/kg	15 days	Check label for withdrawal period.
	Water	8-22mg/kg	20 days	
Enrofloxacin	I/M	2.5mg/kg	10 days	
Zinc oxide (Feed additive)	Feed	2500g/ton		

Withdrawal period is product specific so review label to confirm. Some recommendations may represent 'off-licence' doses. DNU= Do not use

Handwritten signature

Handwritten signature

Handwritten signature

Antimicrobial Use Guidelines



PIGS

USE

Penicillin
Oxytetracycline
Amoxicillin
Tylosin
Neomycin
Tiamulin
Tilmicosin
Florfenicol
Chlortetracycline

THINK

Trimethoprim-sulphonamides
Lincomycin
Spectinomycin

STOP

Only use if culture and antibiotic
sensitivity testing performed

Ceftiofur
Fluroquinolones -enrofloxacin,
marbofloxacin
Gentamicin

BLACK (CRITICAL) - DO NOT USE FOR ANY REASON:

4th generation Cephalosporins, Colistin, Amikacin,
Chloramphenicol, Metronidazole.

KEY:

Green: Use these antibiotics as a 1st choice option

Yellow: If a green option is not suitable then these are 2nd choice options

Red: Only use after culture and sensitivity testing, if no other option is
available.

Black: Do not use under any circumstances

Skin Diseases



DOG
CAT

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT
Skin infections <i>Staphylococcus spp.</i>	Erythema, crusts, alopecia, exudate and itching. Deep- pain and swelling, draining tracts, lymph nodes enlarged.	Clinical signs diagnostic, but cytology should be performed to differentiate from <i>Malassezia</i> dermatitis. Culture and sensitivity required if recurrent disease, rods on cytology or concern for multi-resistant organisms.	- For superficial disease, topical treatment only is indicated- 2-4% chlorhexidine is the best choice. - Topical antibiotics are a second option. Systemic antibiotics are not needed. Oral prednisolone is helpful. - For deep pyoderma then topical (as above) + systemic treatment indicated. Without a culture, first line options should be used such as amoxicillin-clavulanate, cephalexin or clindamycin. - For furunculosis with draining tracts: cephalexin or trimethoprim-sulphonamide + topical treatment. - In the case of methicillin resistance: for small lesions then gels, creams containing benzyl peroxide, silver sulfadiazine or chlorhexidine should be used. For larger areas use topical chlorhexidine, iodine or 0.5% sodium hypochlorite solution suggested with 10 minutes contact time, or if not possible then antibiotic use should be guided by culture. - Reasonable first line options are trimethoprim-sulphonamide, clindamycin or gentamicin. Must control primary cause of infection- e.g. atopic skin disease, parasites, endocrinopathies
Malassezia dermatitis <i>Malassezia</i>	Alopecia, erythema, itching, odour to skin.	Cytology shows distinctive organisms.	- Must control primary cause of infection- e.g. atopic skin disease, parasites, endocrinopathies. - Topical 2% chlorhexidine/2% miconazole shampoo is first line +/- ketoconazole orally. Itraconazole can be used as a second option. - Use shampoo as a preventative/control measure long term.
Abscesses <i>Mixed bacteria</i>	Swelling filled with purulent material.	Clinical signs sufficient for diagnosis. Fine needle aspiration. Culture and AST performed if treatment fails.	- Draining and flushing of the abscess with clean water or dilute iodine is the best treatment. - Antibiotics are only required if the animal is systemically unwell or immunosuppressed, in which case amoxicillin, amoxicillin-clavulanate or cephalexin are good options. - NSAIDS for pain management.

Handwritten signature

Handwritten signature

Handwritten signature

Skin/Ear Diseases



DOG
CAT

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT
Otitis externa <i>Staphylococcus, streptococcus, pseudomonas and others.</i>	Erythema, discharge, pain, ulceration, bleeding in the ear canal	Can diagnose from clinical signs but in-house cytology should be performed to determine what organisms are present. If rods present, recurrent infection, lack of response to treatment or ulceration then culture should be done	- If cocci seen: Topical treatment with a product containing enrofloxacin (preferred if ruptured ear drum) or marbofloxacin or chloramphenicol. Systemic treatment not advised. - If rods seen: EDTA flush followed by topical dexamethasone and enrofloxacin (if ruptured ear drum), if intact then gentamicin preparations + EDTA flush. Systemic treatment not advised. - If <i>Malassezia</i>: If mild then cleaning ear may be sufficient. Otherwise, commercial ear preparations containing clotrimazole or miconazole are first line (not containing fluroquinolones), but not safe in cases of ear drum rupture. Systemic anti-fungals can be considered if unable to medicate ears. - Oral prednisolone is a useful treatment in some cases. - Must control primary cause of infection- e.g. atopic skin disease, parasites
Wounds	Obvious clinical signs but examine wound carefully to determine what structures are involved e.g. joints or body cavities.	Clinical signs enough, but culture and AST required when first line treatment fails.	- Clip, thoroughly clean and flush to remove debris. Debride any dead tissue as required. - Antibiotics only required if systemically unwell, large tissue involvement, potential joint or body cavity involvement or the patient is immunosuppressed. - Amoxycillin-clavulanate is a good first line option S/C then PO administration. - If IV is needed, then ampicillin/amoxicillin/1st generation, procaine penicillin is good choice. - NSAIDs for pain management. - Fluroquinolones should not be used without culture as may predispose to more serious infections.
Dermatophytosis <i>Microsporum or Trichophyton</i>	Circular patches of alopecia with scale and crust, variable itching.	Surface cytology, woods lamp, fungal culture, trichogram.	- Combination of topical, systemic and environmental treatment. - Topical treatment with miconazole/chlorhexidine shampoo combined with treatment of lesions with miconazole cream. - Systemic treatment: itraconazole or terbinafine - Environmental decontamination: wash bedding, carpets, disinfect surfaces, clip hair if needed. Caution owner about potential zoonosis. - Treat animal and environment for 6-10 weeks or until cured.

Handwritten signature

Handwritten signature

Handwritten signature

Urinary Diseases



DOG
CAT

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT
Feline lower urinary tract disease (FLUTD)	Bloody urine, straining to urinate, urinating in unusual places, unable to urinate, licking back end.	Look for causes of symptoms: urinary stones, infection, cancers, kidney disease, blockage. Ultrasound, culture and AST, radiographs and blood tests. In-house cytology to look for bacteria.	- Bacterial causes are less common so antibiotics are not indicated without a culture. If an obvious cause is found, e.g. stones or blockage, treat these appropriately. - If bacteria seen on cytology then begin treatment with amoxicillin or doxycycline for 3-5 days or until culture results received. NSAIDs for pain relief are required. - Adjunctive measures include reduction of stressors, behavioural or dietary modification, increased water intake. - If animal has no clinical signs but returns a positive culture then it is not recommended to treat.
Pyelonephritis	Lethargy, inappetence, vomiting, diarrhoea, fever, pain.	Clinical signs + signs of kidney injury + positive urine culture.	- Culture and sensitivity is strongly recommended in all cases. - Trimethoprim-sulphonamide and fluroquinolones (e.g. enrofloxacin, marbofloxacin) Supportive treatment- care with NSAIDs if renal compromise. IV fluids recommended.
Canine cystitis	Urinating frequently, straining or squatting for long periods, passing urine in unusual location, blood in urine. Pain or discomfort on urination.	Culture and sensitivity advised particularly if problem is recurrent or non-resolving.	- Cystitis unlikely for entire male dogs, instead consider prostatitis. Rule out urinary incontinence, urolithiasis, vaginitis. - Amoxicillin or trimethoprim-sulphonamides are good options that reach high concentrations in urine. - Treat for 3-5 days. - NSAIDs help with pain. - If recurrent infection, take sample for culture and start same antibiotic pending results. Pursue further diagnostic testing to rule out other issues
Prostatitis	Often entire male dogs- lethargy, pain, fever, blood in urine, can lead to dehydration and shock.	Clinical symptoms, ultrasound of prostate, rectal exam Culture	Trimethoprim/sulphonamide or enrofloxacin/marbofloxacin 4 weeks AND perform castration to prevent recurrence.

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

Eye Diseases



DOG
CAT

DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT
Feline Conjunctivitis	Redness/swelling of conjunctiva, ocular discharge, squinting or blinking, rubbing at eye	Fluorescein test for ulcers Conduct Schirmer tear test to rule out dry eye	- In cats, mycoplasma and Chlamydomphila are causes of conjunctivitis: treat with systemic doxycycline for 21-28 days (amoxicillin-clavulanate for pregnant queens). - Consider viral disease e.g. herpesvirus, in which case antibiotics not required, acyclovir drops can be used. Fusidic acid drops can be used only if secondary infection. - Check no eyelid deformities.
Canine conjunctivitis	Redness/swelling of conjunctiva, ocular discharge, squinting or blinking, rubbing at eye	Fluorescein test for ulcers Conduct Schirmer tear test to rule out dry eye	- Bacterial conjunctivitis uncommon- check for other causes such as allergies, eyelid deformities, hair abnormalities and KCS. - Fusidic acid or chloramphenicol eye drops for 5-7 days if no other obvious causes. Systemic treatment not required.
Dry eye (KCS)	Mucopurulent discharge, conjunctivitis, blepharospasm, ulcers, pigment of cornea.	Diagnosis is made using Schirmer tear tests. A result <15mm in 60 seconds is indicative. Fluorescein test for ulcers	- If result <15mm/min and a predisposed breed initiate treatment, otherwise recheck value in 1 month. If <10mm start treatment immediately. - Cyclosporine drops- commercially 0.2% or compounded 1% or 2% solution twice a day ongoing treatment. - Pilocarpine if neurogenic KCS (ipsilateral dry nose also present) Artificial tears/eye lubricant until tear production resumes. - Check that no ulcers are present and treat if needed. - Antibiotics not required unless ulceration or severe secondary bacterial infection.
Ulcers	Redness, tearing, squinting, rubbing at the eye, corneal oedema, holding eye shut, third eyelid elevated, hyperaemia/blood vessel proliferation.	Fluorescein test for ulcers Conduct Schirmer tear test to rule out dry eye	- NSAIDs are required for pain relief - Superficial uncomplicated ulcers: chloramphenicol eye drops +/- eye lubricants until ulcer is fully resolved. - Rule out other causes of ulcers such as dry eye and eyelid abnormalities. - Complicated ulcer - deep or melting: Chloramphenicol + gentamicin/ciprofloxacin eye drops +/- topical serum/plasma. - Treat every 2-4 hours until stabilised then every 6-8 hours. - If cornea is perforated, then add systemic antibiotic e.g. amoxicillin-clavulanate.

nb: 11/11/11

[Handwritten signature]

[Handwritten signature]

Gastrointestinal Diseases



DOG
CAT

DISEASE	DIAGNOSTICS	TREATMENT
Vomiting +/- Diarrhoea-uncomplicated	Faecal exam for parasites, cytology, antigen testing for parvovirus/giardia, PCR panels for chronic problems. Culture and AST. Biopsy	- Vomiting without diarrhoea: supportive treatment only, no antibiotics required. - Diarrhoea with no blood or signs of sepsis: no antibiotics required, supportive treatment of fluids and bismuth subsalicylate can be used. Rule out parasites or treat with wormer. - Chronic diarrhoea where antibiotic-responsive diarrhoea suspected: tylosin or doxycycline. Note all other options should be ruled out before using long courses of antibiotics (e.g. diet trial, anti-inflammatories) - Giardia: Fenbendazole for 3-5 days or Febantel for 3 days. - Note: amoxicillin-clavulanate use associated with amoxicillin-resistant E-coli shedding from treated animal so should not be used unless necessary. No evidence to suggest metronidazole reduces severity or duration of illness and should not be used.
Haemorrhagic gastroenteritis (including parvovirus)	Culture and AST. Tests for parvovirus Clostridial perfringens PCR	- Haemorrhagic diarrhoea with no sepsis: provide supportive care and fluids and monitor for sepsis. - Acute haemorrhagic diarrhoea with neutropenia or sepsis (including parvovirus): amoxicillin/ampicillin + gentamicin. Care with gentamicin in hypovolaemic animals. - Supportive treatment very important including: IV fluids, anti-emetics, pain relief (e.g. buprenorphine), treatment of concurrent parasites and nutritional support. - Sepsis indicators: systemically unstable with neutropenia, low blood pressure (after correction of hypovolemia), hypoglycaemia.
Pancreatitis	Ultrasound examination best	Antibiotics not generally recommended. Treatment involves pain relief, fluids, nutritional support, anti-emetics, appetite stimulants and nursing care.

Handwritten signature

Handwritten signature

Handwritten signature

Systemic Diseases



DOG
CAT

DISEASE	DIAGNOSTICS	TREATMENT
Feline - acute fever <i>Mixed causes</i>	Careful clinical exam and history- look for abnormalities or pain. X-rays and ultrasound Blood tests Joint taps for swollen joints, blood cultures.	- In cats, main differentials if little else found are cat fight wounds or viral infections. If strong suspicion of bacterial infection then use amoxicillin-clavulanate or doxycycline. - NSAIDs can be used if diagnosis is strongly suspected, or not given in order to assess the response to treatment.
Canine - acute fever <i>Mixed causes</i>	Careful clinical exam and history- look for abnormalities or pain. X-rays and ultrasound Blood tests Joint taps for swollen joints, blood cultures.	- In dogs, fever is less likely to be bacterial unless obvious source found. - Consider immune-mediated disease, tick borne disease, meningitis and inflammation of long bones. Collect samples prior to treatment. If bacterial cause suspected, then use amoxicillin-clavulanate. - If animal is septic, then initiate treatment as for septic abdomen below. NSAIDs or other pain relief. - If systemically unwell, provide IV fluids and supportive care.
Septic abdomen <i>Mixed bacteria</i>	Clinical exam or history of possible abdominal issues/surgery etc. Blood tests X-rays and ultrasound.	- Surgery to correct the cause of the septic abdomen required. - Supportive treatment includes coverage with antibiotics: amoxicillin/ampicillin + metronidazole + gentamicin/enrofloxacin - Multiple species of bacteria are likely to be involved so full spectrum coverage required. Transition onto oral medication once stabilised. - IV fluids and supportive treatment for pain.
Feline panleukopenia <i>Feline panleukopenia virus/feline parvovirus</i>	High fever, depression, dehydration, anorexia, vomiting, hypersalivation, diarrhoea not always present. Abdominal pain. Hypothermia. Decreased WBC count.	- Supportive care: IV fluids (added dextrose if hypoglycaemic), Anti-emetics, Anthelmintics, Early nutritional support. - Antimicrobials should be broad spectrum: ampicillin/amoxicillin + fluroquinolones (e.g. marbofloxacin), IV preferred initially. Avoid gentamicin in dehydrated animals. Amoxicillin-clavulanate is an alternative option. - Poor prognosis and euthanasia should be considered on welfare grounds for severely affected animals. - Vaccination if available.

Handwritten signature

Handwritten signature

Handwritten signature

Respiratory Diseases



DISEASE	CLINICAL SIGNS	DIAGNOSTICS	TREATMENT
Feline - upper respiratory disease ('cat flu') <i>Calicivirus, herpesvirus, Bordetella, chlamydia</i>	Mixed symptoms depending on agent, often sneezing and nasal discharge, ocular signs (ulcers, conjunctivitis, chemosis), inappetence, fever, lethargy	Clinical signs often sufficient but tests can be done in outbreaks such as respiratory PCR. Nasal swabs are not recommended	- Antibiotics are rarely needed for simple infections- infection will resolve in 10 days. Supportive therapy with fluids, appetite stimulants, NSAIDs and steam nebulisation may be helpful. - If herpesvirus is suspected- e.g. ulcers are present alongside respiratory signs then famciclovir could be considered though conflicting efficacy. - If symptoms > 10 days with no improvement, then further investigation needed. - Antibiotics should only be considered if purulent nasal discharge with fever or anorexia: doxycycline is the best option, for kittens < 4 weeks where tooth discolouration may occur then amoxicillin can be used (though poor action against some agents). - Vaccination possible for some causes of cat flu.
Canine - upper respiratory disease ('kennel cough')	Cough- sounds like a goose honk and often followed by retching or gagging. Tracheal pinch/palpation produces cough. May also have fever, nasal discharge, anorexia.	Clinical signs and history often sufficient for diagnosis.	- No antibiotics required for uncomplicated cases where patient is systemically well and symptoms last less than 10 days. - If systemically unwell or symptoms over 10 days then doxycycline is the best choice, or amoxicillin-clavulanate if unable to give doxycycline. Treat for 7 days and provide NSAID. Vaccination possible for some agents.
Lower respiratory disease	Coughing, rapid breathing, respiratory distress, fever, lethargy. Auscultation of thorax - harsh breath sounds, crackles.	Rule out other causes e.g heart failure. X-ray of thorax, blood tests, bronchoalveolar lavage sample for culture and AST testing.	- Mild or Chronic infection: doxycycline - Aspiration pneumonia, not immediately life-threatening: oxygen and amoxicillin-clavulanate Acute life-threatening disease: ampicillin/amoxicillin + gentamicin/enrofloxacin IV, with IV fluids, saline nebulisation and coupage. - Note extended courses of treatment may be needed. Evaluate response after 2 weeks. Vaccination is possible for some causes of pneumonia

Handwritten signature

Handwritten signature

Handwritten signature

Antibiotic Use for Surgery



DOG
CAT

SURGERY TYPE	EXAMPLES	RECOMMENDATIONS
CLEAN SURGERY	Routine spay or castrate. Lump removal. Exploratory laparotomy with no viscus entry. Scale and polish dental procedure.	No antimicrobials needed pre-surgery, during surgery or after surgery,
CLEAN-compromised patient	As above, but with a patient where an infection would be a serious issue. e.g. bacterial skin disease, surgical duration over 90 mins, endocrine disorder, debilitated or immunosuppressed patient.	Amoxicillin or 1 st generation cephalosporin (e.g. cephazolin). Use prior to surgery and continue dosing at correct intervals for no longer than 24 hours.
CLEAN-Orthopaedic	Implant placement- e.g. plates, pins, screws.	If no implant placement or other risk factors, treat as for clean surgery and no antibiotics are needed. If implant placement then amoxicillin or cephazolin (or other 1 st generation cephalosporin). Use prior to and during surgery only.
CLEAN-CONTAMINATED	Surgery involving entry into a hollow viscus, e.g. gut, bladder with no significant contamination of abdomen. Minor break in aseptic technique. Cystotomy. Foreign body removal.	Amoxicillin or 1 st generation cephalosporin prior to surgery and maintain coverage for no more than 24 hours.
CONTAMINATED	Surgery involving significant contamination- e.g. traumatic wound, laparotomy with abdominal contamination, pyometra.	Amoxicillin/cephazolin + gentamicin (+metronidazole if colonic involvement) prior to surgery and maintain coverage for 24-48 hours.
DIRTY	Purulent material already present- e.g. necrotic wounds Peritonitis- perforated gastrointestinal tract Faecal contamination.	Culture and sensitivity preferred to determine antibiotic coverage. Gut contamination can be treated as above. Continue antibiotic treatment until clinical signs resolved.
DENTAL	Dental procedures involving extractions are likely to induce a temporary bacteraemia.	Antibiotics are only required for animals who are unable to tolerate a short period of bacteraemia e.g. geriatrics, heart disease, immunosuppressed or otherwise compromised with systemic disease. Clindamycin or amoxycillin for no more than 24 hours

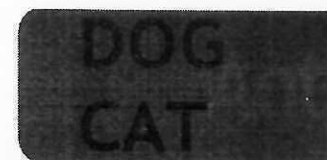
Amoxicillin and 1st generation cephalosporins should be given IV 30-60 mins prior to surgery and re-dosed every 2 hours until surgery is finished.

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

Antibiotics



ANTIBIOTIC	ROUTE	DOSE	DOSING FREQUENCY	CONTRAINDICATIONS/ WARNINGS
Amoxicillin	IV, PO, IM	11-22mg/kg	q8-12hr	Anorexia, vomiting, diarrhoea, hypersensitivity possible.
Ampicillin	IV, IM, SC	10-20mg/kg	q6-8hr	Hypersensitivity, vomiting, diarrhoea possible. Slow IV admin over 3 minutes.
Penicillin	IM	20-40,000IU/kg	q12hr	Hypersensitivity reactions possible.
Amoxicillin-Clavulanic acid	PO, IM, SC, IV	12.5-25mg/kg	Q8-12hrs	Hypersensitivity, vomiting, diarrhoea, anaphylaxis on IV administration during general anaesthetic possible.
Cefazolin	IV, IM	20-35mg/kg (22mg/kg surgical use)	q8hrs	Hypersensitivity or pain possible.
Cephalexin	PO	22-30mg/kg	q12hrs	Vomiting and diarrhoea, hypersensitivity reactions possible.
Doxycycline	PO	5mg/kg BID 10mg/kg SID	Q12-24hrs	Tooth discolouration possible in young and pregnant animals. Follow tablets with water or food.
Trimethoprim-Sulphonamide	PO, IV	15-30mg/kg	q12hrs	Prolonged use can lead to urinary signs (blood/crystals in urine), leukopenia, thrombocytopenia, KCS and others. Dose carefully.

Check medication information and adverse effects warnings carefully to determine if product is suitable for the patient

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

Antibiotics



DOG
CAT

ANTIBIOTIC	ROUTE	DOSE	DOSING FREQUENCY	CONTRAINDICATIONS/ WARNINGS
Metronidazole	PO, IV	PO: 10-15mg/kg Dogs: IV 10mg/kg	q12hrs	Neurological signs, gastrointestinal upset, hepatotoxicity, haematuria possible. IV admin should be very slow.
Clindamycin	IV, IM	11mg/kg Toxoplasma: 25mg/kg	Q12hrs	IV use: dilute 1:10 in saline and admin over 60 minutes. Follow capsules with water or food. Diarrhoea.
Enrofloxacin	PO, IV	Dogs: 5-20mg/kg Cats: 5mg/kg slow IV	q24hr	Blindness and neurological signs in cats. Slow IV to avoid neurological effects. Vomiting, diarrhoea, inappetence possible. Arthropathy in growing animals. Avoid in young animals and cats if possible.
Marbofloxacin	PO	2.75-5.5mg/kg	Q24hrs	Inappetance, vomiting, diarrhoea and arthropathy in young animals. Avoid use in growing animals if possible.
Gentamicin	IV, IM	Dog: 9-14mg/kg Cat: 5-8mg/kg	Q24hours	Ototoxicity, nephrotoxicity, pain on injection possible. Care when using in dehydrated, compromised, young and old patients.

Check medication information and adverse effects warnings carefully to determine if product is suitable for the patient

Handwritten signature

Handwritten signature

Handwritten signature

Antimicrobial Use Guidelines



Use

Penicillin
Amoxicillin
Doxycycline
Oxytetracycline
Ampicillin
Chloramphenicol

Think

Trimethoprim-sulphonamide
Amoxicillin-clavulanate Cephalexin
Cephazolin/cephalothin
Clindamycin
Gentamicin
Metronidazole
Neomycin

Stop

Ceftiofur,
Ceftriaxone,
Cefovecin
Fluoroquinolones - enrofloxacin,
marbofloxacin, orbifloxacin,
pradofloxacin,

BLACK (CRITICAL) - DO NOT USE FOR ANY REASON:
4th generation Cephalosporins, amikacin, cefotaxime,
vancomycin, meropenem, rifampicin, tigecycline,
ticarcillin-clavulanate, piperacillin/tazobactam,
aztreonam

KEY:

Green: Use these antibiotics as a 1st choice option

Yellow: If a green option is not suitable then these are 2nd choice options

Red: Only use after culture and sensitivity testing, if no other option is available.

Recommended Vaccination



Cattle

VACCINE	RECOMMENDED SCHEDULE	NOTES
Foot and Mouth Disease (FMD)	1 st Dose: 4 months and above 2 nd Dose: 1 month later Booster doses: Every 6 months	Dose in August/September and in February/March
Lumpy Skin Disease (LSD)	1 st Dose: 3 months old Booster doses: Annually	January- March each year
Haemorrhagic Septicaemia (HS)	1 st Dose: 4 months and above Booster doses: Biannually, Annually	Before rainy season.
Black Quarter (BQ)	1 st Dose: 4 months and above Booster doses: Annually	
Anthrax	To control an outbreak only	

Pigs

Foot and Mouth Disease (FMD)	1 st Dose: 4 months and above 2 nd Dose: 1 month later Booster doses: Every 6 months	Dose in August/September and in February/March
Classical Swine Fever (CSF)	1 st Dose: 6-8 weeks old Booster doses: Annually	Dose in August/September
Anthrax	To control an outbreak only	

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

Recommended Vaccination

Sheep and Goats



VACCINE	RECOMMENDED SCHEDULE	NOTES
Foot and Mouth Disease (FMD)	1 st Dose: 4 months and above 2 nd Dose: 1 month later Booster doses: Every 6 months	Dose in August/September and in February/March
Peste des petits ruminants (PPR)	1 st Dose: 3 months old and above Booster doses: Annually	February-March each year
Enterotoxaemia	1 st Dose: 4 months and above Booster doses: Annually	To control outbreaks
Anthrax	To control an outbreak only	

Dogs

Rabies	1 st Dose: 10-12 weeks old 2 nd Dose: 1 month later Booster doses: Annually	
Parvovirus, Distemper, Hepatitis, Parainfluenza, Leptospirosis	1 st Dose: 6-8 weeks old Booster doses: 1 month later Booster doses: Annually	Dose in August/September
Canine coronavirus	1 st Dose: 6-8 weeks old Booster doses: 1 month later Booster doses: Annually	

Handwritten signature

Handwritten signature

Handwritten signature

Recommended Vaccination

Poultry- Broiler

VACCINE	AGE
Newcastle Disease (ND)	5-7 days
Infectious Bursal Disease (IBD)	8-12 days
Infectious Bursal Disease (IBD)	18-21 days
Newcastle Disease (ND)	24-28 days

Handwritten signature



Poultry- Layer

VACCINE	AGE
Mareks	1 day
Newcastle Disease (ND)	12-28 days 14 weeks
Infectious Bursal Disease (IBD)	12-42 days 14 Weeks
Newcastle Disease (ND) and Infectious Bronchitis (IB)	30-82 days 50-94 days 8-10 weeks 16 weeks
Fowl Pox	42 days 14-21 weeks

Vaccination schedule for Layers bird varied widely among individual farm, geography and epidemiology of disease

Handwritten signature

Handwritten signature

Clinical Parameters



SPECIES	HEART RATE	RESPIRATORY RATE	TEMPERATURE	GESTATION
CATTLE	40-80 (Adult) 80-120 (Calf)	15-30	38.0-39.0 (Adult) 38.5-39.5 (Calf)	279-291 days
SHEEP	70-90	20-30 (Adult) 30-45 (Lamb)	38.5-40.0 (Adult) 39.0-40.0 (Lamb)	150 (140-160) days
GOAT	70-80	12-20	39.0-40.0	145-155 days
PIG	60-110 (Adult) 200-220 (Piglet)	10-20 (Adult) 24-36 (Piglet)	38.5-39.5	115 (110-116) days
POULTRY	200-400	15-30	40.5-42.0	21 days egg incubation
HORSE	28-40 (Adult) 60-100 (Foal)	8-16 (Adult) 20-80 (Foal)	37.0-38.5	320-380 days
DOG	60-120 (Adult) 160-220 (Puppy)	15-30	37.5-39.5 (Adult) 35.0-37.7 (Puppy 1-3 weeks)	64-66 days
CAT	120-180 (Adult) 220-260 (Kitten)	20-30 (Adult) 20-40 (Kitten)	38.0-38.5 (Adult) 38.0-39.0 (Kitten)	63-65 days

Handwritten signature/initials.

Handwritten signature/initials.

Handwritten signature/initials.