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ROYAL GOVERNMENT OF BHUTAN  
Ministry of Agriculture and Forests  
Department of Livestock  
National Centre for Animal Health



# NATIONAL VETERINARY DRUG FORMULARY



**2016**

**THIRD EDITION**

Compiled by

Drugs Vaccine & Equipment Unit  
National Centre for Animal Health  
Serbithang, Thimphu

First Edition © 2011

Second Edition © 2013

Dedicated to Veterinarians, the cornerstone of our profession, Para-Veterinarians, the indispensable force behind, and Veterinary Students, our profession's future –  
Continue your pursuit of excellence!

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Department of Livestock

National Centre for Animal Health

## PREFACE

The third edition of the National Veterinary Drug Formulary 2016 is published with the main objective to provide relevant information on various types of veterinary drugs currently used in Bhutan. It is expected that the formulary will be useful source of information for all competent professionals under the Department of Livestock and academic institutes pursuing veterinary profession in the country.

The formulary provides useful information like class, action, indications, dosage, contra-indications and pharmaceutical precautions to be considered during use. The drugs have been classified according to the pharmacological groups for easy reference.

The book contains sections on list of pharmaceutical companies and suppliers dealing with veterinary medicines, vaccines and equipment in Bhutan, new product profiles for newly included veterinary medicines in this revised edition, formulae for the extemporaneous preparation of mixtures, ointments and other medicine and details on vaccines that are used in the country.

The revised edition also includes veterinary medicines which are used in poultry, wild life and aquatics in order to streamline the procurement, usage and monitoring system for Essential Veterinary Drug Program (EVDP) by concerned agencies and other non-departmental agencies in the country.

Tremendous efforts have been put to make this book user friendly and in line with the Bhutan National Formulary published by the Drug Regulatory Authority (DRA). It is hoped that this book will serve the purpose intended and all the readers will benefit immensely.

## FOREWORD

It is with immense pleasure and satisfaction that the National Centre for Animal Health is able to bring out the third edition of the National Veterinary Drug Formulary (NVDF 2016) as provisioned in the National Veterinary Drug Committee's (NVDC) mandates.

Since its last revision during the year 2011, the procurement, distribution and management of veterinary drugs, vaccines and equipment had undergone a sea of changes. As such, it is only befitting that the revision is undertaken on timely basis in order to keep pace with the revised strategies as well as according to the global advances and market availability of veterinary products.

This revised edition is expected to be a useful source of information and a guide for rational and appropriate use of veterinary medicines to achieve the best therapeutic outcomes in animal patients and wish all competent professionals under the Department of Livestock and academic institutes pursuing veterinary profession in the country to benefit from this book.

On behalf of the Department of Livestock, I would like to commend the editorial team for their effort and dedication in successfully bringing out this third edition. Further, the contributions made by field staffs under the Department of Livestock in bringing out this revised NVDF 2016 are highly appreciated.



(Dr. Tashi Samdup)

**DIRECTOR GENERAL**

**Director General,  
Department of Livestock,  
Ministry of Agriculture & Forests**

## ABBREVIATION

q	qua que (every/per)
BID	Bis In Die (Twice daily)
BW	Body Weight
CVH	City Veterinary Hospital
DLO	District Livestock Office
DoFPS	Department of Forest and Park Services
DoL	Department of Livestock
DRA	Drug Regulatory Authority
DVEU	Drugs, Vaccines and Equipment Unit
DVH	District Veterinary Hospital
EVDL	Essential Veterinary Drug List
EVDP	Essential Veterinary Drug Program
Hcl	Hydrochloride
IM	Intramuscular
IV	Intravenous
IU	International Unit
LCS	Livestock Central Store
MAH	Market Authorization Holder
MoAF	Ministry of Agriculture and Forests
NAH	National Animal Hospital
NCA	National Centre for Aquaculture
NCAH	National Centre for Animal Health
NPDC	National Poultry Development Centre
NSAID	Non-steroidal Anti-inflammatory Drugs
NVDC	National Veterinary Drug Committee
NVDF	National Veterinary Drug Formulary
OD	Om Ni Die (Once daily)
PO	Per Os (Oral)
QID	Quarter In Die (Four times a day)
RLDC	Regional Livestock Development Centre
SC	Subcutaneous
TID	Ter In Die (Three times a day)
WCD	Wildlife Conservation Division

## CONVERSION TABLE

1 g	=	1000 mg
1 mg	=	1000 mcg
1 mcg	=	0.000001 kg
1 litre	=	1000 ml or cc
1% W/V	=	1 g solid/drug dissolved in 100 ml of solution
1% V/V	=	1 ml liquid in 100 ml solution
1% W/W	=	1 g solid/drug in 100 g of ointment

*(Source: BNF 2013, DRA, Thimphu)*

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## LIST OF PHARMACEUTICAL COMPANIES

Agarwal	Medion
Anhil Parenterals Pvt Ltd	Merck
Arora Pharmaceutical Pvt Ltd, New Delhi, India	Morvel Laboratory Pvt Ltd
Ashish Life Science Pvt Ltd, India	MSD
Brilliant Pharma	Natural Remedies
Cadilla Pharmaceuticals	Neon Laboratory
Celogen	Novartis, India
Claris Life Sciences	Oxen Laboratory
Denis Chem Laboratory	Pentagone
Dev Life	Pharmacorp
Hester Biosciences Ltd, Gujarat, India	Polymed Pharmaceutical Pvt Ltd
Himalaya	Provet
Holden Medical Laboratories Pvt Ltd	Rajdip Pharmaceutical
Indian Immunologicals Ltd, Hyderabad, India	Ramachandra
Jackson Laboratories, Amritsar, India	Ruby
Johnson & Johnson Ltd, India	Safecon Life Sciences
Laborate Pharmaceuticals	Shegfrieds India
Medicocity	Shelter Pharma



Shreya Life Science, India

Sirmaxo Chemical Pvt Ltd,  
Mumbai, India

Soft Medicaps Ltd

Soft Medicare

Solar Surgical & Pharmaceuticals,  
Mumbai, India

Stallion Laboratory

Torrents Pharma

Ukay Remedies

Venkateshwara Hatcheries Pvt Ltd,  
Pune, India

Vet India Pharmaceutical Ltd,  
Hyderabad, India

Vetsfarma

Vetoquinol Animal Health,  
Howrah, India

Vins

Virbac Animal Health, Mumbai,  
India

Vsol

Zydus Animal Health,  
Ahmedabad, India

# MARKET AUTHORIZATION HOLDER/LOCAL SUPPLIERS

AK Enterprise, Phuntsholing

Bhutan Indo Company Pvt. Ltd,  
Phuntsholing

Changlo Chen Enterprise,  
Thimphu

Dhejung Pharmaceutical &  
Medical Supplies, Thimphu

Druk Wangmo Supplier,  
Thimphu

Druk PG Enterprise,  
Phuntsholing

Druk Scientific Suppliers,  
Thimphu

Karma Pharmaceutical &  
Medical supplies, Thimphu

Karma Tshongkhang, Thimphu

KG Trading, Thimphu

KGT Pharmaceutical & Medical  
Supplies, Thimphu

KMT Pharmaceutical & Medical  
Supplies, Thimphu

Kuenga Trading, Gelephu

Kuenphen Pharmacy, Thimphu

Lama Enterprise, Thimphu

MS Tshongkhang, Phuntsholing

Ngangpa Pharmaceutical &  
Medical supplies, Thimphu

Paras Pharmaceutical & Medical  
Supplies, Tsirang

Rabten Medicals, Phuntsholing

Sai Trading partners, Thimphu

Tsampaka Pharmaceutical &  
Medical Supplies, Thimphu

Wangmo Enterprise, Mongar

Vetline Pharmaceutical &  
Medical Supplies, Sarpang

Yarab Enterprise, Thimphu

Yoedbar Enterprise, Thimphu

Zamling Suppliers, Thimphu

### **Streptomycin Injection**

Each vial contains Streptomycin 1gm base (as sulfate).

For treatment of pasteurellosis, salmonellosis, brucellosis, actinomycosis, actinobacillosis, bovine tuberculosis, abortion in cattle/buffaloes; for brucellosis, Glaser's disease, pink eye & poll eye in horses; for brucellosis, abortion & erysipelas in sheep/goat; for swine erysipelas, pasteurellosis & enzootic pneumonia in swine and for leptospirosis & brucellosis in dogs. Cattle/sheep/goat/horse/buffalo/pig - 10mg/kg BW, Dog - 25mg/kg BW OD.  
1gm vial

### **Procaine penicillin G + Penicillin G Sodium Injection**

Each siliconised vial contains Procaine Penicillin G IP: 15,00,000 units Penicillin G Sodium IP: 5,00,000 units

Diseases caused by penicillin sensitive organisms like anthrax, abscesses, mastitis, UTI, wounds, calf diphtheria, post-castration infections

Add 4 ml of distilled water to the vial. IM injection. Large & medium sized animals 10000 units per kg BW. Small animals 200000 – 400000 units at 24 hrs interval.  
20 ml vial

### **Penicillin G Procaine in Oil Injection**

Each ml contains Procaine penicillin G 3 lacs IU and Aluminium monostearate 2%

In treatment of conditions caused by organisms with low penicillin resistance particularly those organisms requiring prolonged exposure to the drug.

Large animals - 8000 IU per kg BW IM. Small animals – 3-6 lacs IU IM

10 ml vial

### **Ceftriaxone Inj.**

Ceftriaxone: 500 mg Ceftriaxone per vial

Mastitis, Bronchitis, Pneumonia, Gastroenteritis, Peritonitis

IM or IV injection. Large animals 10mg / kg BW. Small animals 20mg/kg BW

500 mg vial

### **Cefquinome-Vet Injection**

Each vial contains 500mg Cefquinome.

In cattle, it is indicated against respiratory disease caused by *Mannheimia haemolytica* and *Pasteurella multocida*. It is also indicated in acute E. coli mastitis, dermatitis, infectious bulbar necrosis, and interdigital necrobacillosis.

In calves, it is effective against E. coli septicemia.

For pigs, it is used to treat bacterial infections of the lungs and respiratory tract caused by *P. multocida*, *H. parasuis*, *A. pleuropneumoniae* and *Streptococcus suis*. Mastitis-metritis-agalactia syndrome involved with *E.coli*, *Staphylococcus*, *Streptococcus* and other cefquinome-sensitive organisms are also treated.

In piglets, the mortality rate in cases of meningitis caused by *Streptococcus suis* is reduced. It is used in the treatment of mild or moderate lesions caused by *Staphylococcus hyicus* and arthritis caused by *Streptococcus* spp. and *E.coli*.

Cattle – 1mg/kg BW once daily for 3-5 consecutive days; Calves – 2mg/kg BW once daily for 3-5 consecutive days; Pigs – 2mg/kg BW once daily for 3 consecutive days; Piglets - 2mg/kg BW once daily for 5 consecutive days. 500mg vial.

**Trimethoprim+Sulphamethoxazole Injection**

Each 5 ml contains - Trimethoprim BP Vet. : 80 mg  
Sulphamethoxazole IP : 400 mg  
Actinobacillosis, actinomycosis, colibacillosis, mastitis, salmonellosis, urogenital infections  
IV injection. Large animals 15 -30 ml; Small animals 2-5 ml daily 30 ml vial

**Enrofloxacin Injection**

Each ml contains -  
Enrofloxacin 100 mg  
Mycoplasmosis, RTI, UTI, acute & chronic mastitis, calf scour, salmonellosis  
IM or slow IV injection. 1ml/20kg BW for 3-5 days in all animals 15 ml vial

**Doxycycline hyclate tablet**

Each tab contains Doxycycline hyclate 50 mg  
Drug of choice for ehrlichiosis, tracheobronchitis syndrome (kennel cough), campylobacter enteritis, leptospirosis, nephritis, prostatitis, *Staphylococcus aureus* pyoderma and *E. coli* enteritis. 5 mg/kg BW every 12 hours orally. The duration of administration depends on the condition being treated, response to the medication and the development of any adverse effects. 100 tab per jar

**Tetracycline Hcl + Erythromycin + Vitamin powder**

Each kg contains Tetracycline 135g + Erythromycin 25g + Vitamins B1, B2 and B6 1.25g each + Vitamin B12 2.5mg + Vitamin C 50g + Sodium 40g + Potassium 25g + Excipients up to 1kg.  
Coryza, fowl cholera, pullorum and CRD  
0.4g per kg BW or 2g per litre of

drinking water administered for 4-5 consecutive days.  
100g sachet

### **Tylosin + Doxycycline powder**

Each gm of powder contains Doxycycline Hcl IP 100mg + Tylosin tartarate 100mg.

Gastrointestinal and respiratory infections caused by tylosin and doxycycline sensitive micro-organisms like *Bordetella*, *Campylobacter*, *Chlamydia*, *Haemophilus*, *E. coli*, *Mycoplasma*, *Pasteurella*, *Rickettsia*, *Salmonella*, *Streptococcus* and *Treponema* spp. in calves, goats, poultry, sheep and swine. For oral administration. Calves, goats and sheep – 5g per 100kg BW for 3-5 days twice daily. Poultry and swine – 1kg per 1000-2000 litres of drinking water for 3-5 days  
100gm sachet

### **Amoxicillin trihydrate + Colistin sulfate powder**

Amoxicillin trihydrate 200g + Colistin sulfate 800million IU per kg + Excipients up to 1kg. Coryza, Colibacillosis and salmonellosis  
1gm per 2 litres of drinking water for 3-5 consecutive days.  
100gm sachet

### **Piperazine hexahydrate solution**

Each 5 ml contains Piperazine hydrate I.P. (equivalent to 1.25 g

of Piperazine base) 2.82 g and Excipients Aqueous base Q.S.

Piperazine hexahydrate is a well proven anthelmintic for adult round worm in poultry. It is one of the most potent and safe anthelmintic which can be given in drinking water.

Poultry: 4-6 weeks - 50 mg/kg BW; 6-12 weeks - 100 mg/kg BW and 12 weeks and above - 200 mg/kg BW in drinking water. Repeat once every month.

Cattle, Buffaloes, Calves & Horses: 15 – 30 ml/30 kg BW.

Dogs & Cats: 0.2 ml/kg BW.  
120ml bottle

### **Levamisole+Oxyclozanide suspension**

Each 5ml contains Oxyclozanide B.P. 150 mg + Levamisole Hcl B.P 75 mg.

A broad spectrum anthelmintic for treatment of parasitic infestations due to roundworms, lung worms, liver flukes and amphistomes.

Sheep - 1 ml per 2 kg BW orally.  
Cattle - 5 ml per 10 kg BW orally.  
1 litre jar

### **Dichlorophen tablet**

Each tab contains Dichlorophen B.P. 0.5g.

For the treatment of Tapeworm in dogs and cats.

By oral administration, preferably just before the main meal of the day given 1 tablet per 2.5 kg BW.

100 tab/jar

**Closantel + Ivermectin Injection**

Each ml contains Closantel 125mg + Ivermectin IP 5mg.

Indicated in mixed trematode and nematode or arthropod infestations.

1ml per 25kg BW. A maximum dose of 10ml at any one site with residual volume at another site by SC in the neck region.

20ml vial

**Furaltadone+Ronidazole powder**

Each 100gm contains 20% Furaltadone+7% Ronidazole.

For treatment of canker, E.coli, Paratyphoid and Coccidiosis in pigeons and cage birds.

As a preventative, use one teaspoon per gallon for 7 to 10 days. For curative, dosage can be doubled, and duration can be 14 days.

100g sachet

**Amprolium+Sulfaquinoxaline powder**

Each kg contains Amprolium 100g + Sulfaquinoxaline 100g + Vitamin K3 2g.

Indicated for coccidiosis.

For treatment, 1g per litre of drinking water following 3-2-3 method i.e. 3 days of treated drinking water, 2 days of plain water and again 3 days of treated drinking water.

For prevention, 1g per litre of drinking water for 3-4 consecutive days.

100g sachet

**Butaphosphan+Cyanocobalamin Injection (Phosphorus inj.)**

Each ml contains Butaphosphan 100mg + Cyanocobalamin (Vitamin B12) 50mcg.

Low productivity, post-partum metabolic disorders like ketosis, infertility, stress conditions.

SC/IM/IV injection. Large animals 10 – 25 ml, Sheep & Goat 2.5 – 8ml, Foal & Calf 5-12 ml.

30ml vial

**Iron and Vitamin B supplement for piglets**

Each ml contains Iron dextran 100mg + Vitamin B6 1mg + Vitamin B12 50mg.

Indicated for prevention and treatment of anemia in nursing piglets caused by insufficient supply of iron from the sow's milk, growth enhancement and mortality reduction in piglets and improvement of body resistance against infections.

2ml per piglet at the age of 2-4 days by IM.

100 ml bottle

**Vitamin B12 Injection**

Each ml contains Cyanocobalamin 100mcg.

Horse, Cow and Sheep – For retarded growth, anemia, anorexia, general listlessness, feed absorption disorder.

Swine – Dermatitis and poor fertility level.

Dog – Nervous system disorders such as distemper, paresis, joint

disorder, anemia due to parasites.  
Adult cows and horses – 1ml per 50kg BW IM.  
Calf and foal – 1.2ml per 20kg BW IM.  
Sheep – 0.3ml per 5kg BW IM.  
Swine – 0.5ml per 25kg BW IM.  
Piglets – 0.5ml per 10kg BW IM.  
Dogs – 0.3ml per 5 kg BW IM.  
100ml bottle

**Methylcobalamin + Vit B6 inj. (Neurovet/Neuroxin)**

Each ml contains Methylcobalamin 500mcg + Vit B6 50mg + Nicotinamide 50mg. Neurological disorders, anorexia, fatty liver degeneration, anemia, post-parturient paresis, as a supportive therapy with antibiotics. IM or IV injection. Large animals 5-10 ml for 3-5 days. Dogs 2-3 ml daily for 3-5 days  
10ml vial

**Ciprofloxacin ear/eye drops**

Ciprofloxacin 0.3% per 5ml. For ophthalmic and ocular infections in animals.

Ophthalmic form can be administered up to every 2 hours and ocular form can be administered twice daily.  
5 ml vial

**Flunixin meglumine Injection**

Each ml contains Flunixin meglumine 50 mg. Colic, inflammation, pain & fever, arthritis, myositis, mastitis,

pneumonia  
IM or IV injection. Cattle, buffaloes, sheep & goat 1-2 ml/45 kg BW., Horse 1ml / 45 kg, pigs 2 ml/ 45 kg, dogs 0.5 – 1ml.  
10ml vial

**Mefenamic acid + Paracetamol Injection**

Mefenamic acid 50mg + Paracetamol 150mg per ml  
Colic, soft tissue injury, rheumatoid arthritis, pain, fever. IM injection. Large animals 10 -15 ml; small animals 3-5 ml.  
30 ml vial

**Phenylbutazone + Analgin Injection (Esgipyrin injection)**

Phenylbutazone 150mg + Analgin 150mg + Lignocaine 10mg per ml. Lameness of any origin, traumatic inflammation of musculoskeletal system, neuritis, non-specific fever.  
Deep IM injection. Large animals 5-15 ml; Small animals 1-5 ml.  
5 ml ampoule

**Triamcinolone acetonide Injection**

Each ml contains Triamcinolone acetonide 6 mg. Bovine ketosis, arthritis, tenosynovitis, allergy, pruritis, hematoma, inflammatory conditions.  
Bovine Ketosis: 2-5 mg to 10 mg IM  
Arthritis, Tenosynovitis: 6-18 mg intra-articular.

Other conditions: Large animals 12 - 20 mg IM or SC, Small animals 0.1 – 0.2 mg/kg IM or SC injection.  
5 ml vial

### **Clostenol Injection**

Each ml contains - Cloprostenol sodium : 263 mcg equivalent to 250 mcg of Cloprostenol.

Induction and synchronization of heat, Persistent Corpus Luteum, termination of pathological pregnancy, pyometra, mummified fetus, induction of parturition.

IM injection.

Cattle & buffaloes: 2 ml.

Mares: 0.5 – 2 ml

Sheep, goat & pig: 0.5 – 1ml

In bitch to terminate mismatching pregnancy: 1 mcg/kg BW and to treat metritis & pyometra: 1 mcg/kg BW.

2 ml ampoule

### **FSH (Follitrophin) Injection**

Each 20 mL vial contains FSH equivalent to 400 mg.

For use in reproductively mature heifers or cows to induce a superovulation.

Administer 2.5 mL IM, twice daily, for four days. Administer prostaglandin F<sub>2α</sub> or a prostaglandin F<sub>2α</sub> analogue, at their manufacturer's recommended dose to cause luteolysis, in conjunction with the 6th dose of

FOLLTROPIN. Breed animals at normal times following observed estrus.

20ml vial

### **Cefuroxime sodium I/mammary**

Each prefilled syringe contains Cefuroxime sodium equivalent to Cefuroxime 250 mg.

Acute or chronic mastitis.

One tube after each milking for 3 consecutive milking.

3.5 gm syringe

### **Botrophase Injection**

Haemocoagulase 11U + Sodium chloride IP 0.9% per ml

For primary, secondary and post-operative internal and external hemorrhages.

All animals – 1ml IV 12 hourly.

1ml ampoule

### **Zinc Sulfate**

Each 500gm jar/packet contains zinc sulfate heptahydrate.

Indicated in Papillomatous digital dermatitis (PDD) also referred to as foot rot/infectious pododermatitis caused by a combined infection of 3-4 bacterial species: *Treponema* spp., *Fusobacterium* spp., *Bacteroides* spp. and *Dichelobacter nodosus*.

Use as 10-20% solutions as footbaths.

500gm jar/packet



**SECTION A**

**VETERINARY DRUGS FOR LARGE  
AND SMALL ANIMALS**

# 1. ANTIMICROBIALS

## 1.1. Amoxicillin Trihydrate

### Class

Amino penicillin

### Action

Amoxicillin inhibits synthesis of bacterial cell wall.

### Indication

Cattle/sheep/goat/horse/pig/dog/cat: Respiratory tract infections, mastitis, urinary tract infections, wound infections, calf scours, otitis, hemorrhagic septicemia, metritis,

Poultry: Necrotic enteritis, infectious coryza, coli septicemia, fowl cholera, fowl typhoid, salmonellosis and CRD.

### Dosage

Dog & cats: 10 - 20mg BID orally.

Cattle, horse, goat and pig: 10mg/kg body weight BID orally.

### Contraindication

Avoid usage in Penicillin hypersensitive patients.

### Precaution

Avoid/use cautiously in the animal with the history of hypersensitivity to beta-lactum inhibitor antibiotics e.g. cephalosporin.

Brand Name	Manufacturer	MAH	Presentation
Amoxirum	Virbac	Karma PMS	1.5g/bolus

## 1.2. Ampicillin + Cloxacillin

### Class

Amino penicillin

### Action

Inhibits synthesis of bacterial cell wall.

### Indication

Cattle/sheep/goat/pig/horse/dog/cat/poultry: Mixed bacterial infections like

mastitis, metritis, septicemia, chronic wounds, systemic and local infections, abscesses, enteritis and pneumonia.

**Dosage**

Cattle/sheep/goat/horse/pig: 5-10mg/kg QID IM, IV, SC  
Dog/Cat: 20mg/kg QID P.O, 10mg/kg QID IM, IV, SC

**Contraindication**

Avoid usage in Penicillin hypersensitive patients. Avoid usage of ampicillin in animals on Methotrexate drugs as it decreases the renal excretion of MTX causing increased levels and potential toxic effects

**Precaution**

Avoid/use cautiously in the animal with the history of hypersensitivity to beta-lactum inhibitor antibiotics e.g. cephalosporin.  
Excreted in milk

Brand Name	Manufacturer	MAH	Presentation
Vetclox Forte	Zydus AH	Karma PMS	Ampicillin 1g + Cloxacillin 1g per vial, 10ml vial

**1.3. Benzathine penicillin**

**Class**

Long acting penicillins.

**Action**

Benzathine penicillin interferes with bacterial cell wall synthesis.

**Indication**

Cattle/Buffalo/Sheep/Goat: Actinomycosis, anthrax, black quarter, tetanus, arthritis, mastitis, metritis, hemorrhagic septicemia, exudative epidermitis, pyelonephritis.

Horse: Strangles, Corynebacterial pneumonia of foals, Tetanus.

Pig: Swine Erysipelas, Tetanus, Foot rot, malignant edema.

Dog, Cat: Rickettsiosis, Tetanus, Wound infection, Respiratory tract infections.

**Dosage**

Cattle, Horse, Sheep, Goat, Swine: 12000 IU/kg BW Deep IM. Repeat

after 48 hours.

Dog, Cat: 40000 IU/kg BW Deep IM, repeat after 48 hours.

### Contraindication

Avoid usage in Penicillin hypersensitive animals.

### Precaution

Deep intramuscular administration only. Avoid/use cautiously in the animal with the history of hypersensitivity to beta- lactum inhibitor antibiotics e.g. cephalosporin. Excreted in milk.

Brand Name	Manufacturer	MAH	Presentation
Benzogen	Celogen Pharma	Karma PMS	2,400,000 IU (2g) per vial (10ml)
Penject La-48	Provet Pharma Pvt Militen	Karma PMS	Procaine penicillin G+ Benzathine penicillin 4.8 lacs/vial, 15ml vial
Fortified Procaine Penicillin	Zydus AHL	Karma PMS	Procaine penicillin + Penicillin G sodium 1.5g + 0.3g
Pebiben La	Vysali Pharma	KMT PMS	Benzathine penicillin 600,000 IU, 2ml vial

## 1.4. Cephalexin

### Class

First generation cephalosporin (Effective against gram positive aerobes)

### Action

Cephalosporins are bactericidal agents related to penicillins with broad spectrum activity by inhibiting cell wall synthesis.

### Indication

Cattle/horses: Respiratory tract infections, urinary tract infections, localized infections in skin and soft tissues.

Poultry: Fowl cholera, gangrenous dermatitis, salmonellosis, coryza and *E coli*.

### Dosage

**Cattle and buffalo:** 5-10mg/kg BW PO BID.

**Dog:** For Pyoderma: 22 – 35 mg/kg PO BID or 22 mg/kg PO TID

For respiratory infections: 20 – 40 mg/kg PO TID  
For soft tissue infections: 30 – 50 mg/kg PO BID  
For systemic infections: 25 – 60 mg/kg PO TID  
For orthopedic infections: 22 – 30 mg/kg PO q6 – 8h for 28 days  
For UTI: 30 – 40 mg/kg PO TID

**Cats:** For soft tissue infections: 30 – 50 mg/kg PO BID  
For systemic infections: 35 mg/kg PO q6 – 8h.

**Poultry:** 35 - 50 mg/kg B.W PO QID.

**Horses:** 22 - 33 mg/kg B.W PO q 6h.

### **Contraindication**

Avoid use in animals with hypersensitivity reaction to Cephalosporin and in the patients with the history of Penicillin hypersensitivity and patients with kidney diseases.

### **Precaution**

High doses or very prolonged use has been associated with neurotoxicity, neutropenia, agranulocytosis, thrombocytopenia, hepatitis, interstitial nephritis, and tubular necrosis.

In lactating animals, small amounts of cephalexin may be distributed into maternal milk which can potentially affect gut flora in suckling young ones.

Brand Name	Manufacturer	MAH	Presentation
Lixen Tab	Virbac	KMT PMS	1.5gm/bolus, 2 boli/strip
Lixen Pdr	Virbac	Karma PMS	7.5%/20gm, 20g sachet

## **1.5. Ceftriazone/Ceftriazone and Tazobactum**

### **Class**

Third generation cephalosporin with semi-synthetic beta lactamase inhibitor.

### **Action**

Ceftriaones have an extended spectrum of action against gram negative organisms. They are resistant to  $\beta$ -lactamases, and penetrate the blood-brain barrier. Ceftriazone interferes with the production of bacterium cell wall peptidoglycans causing cell lyses. Tazobactum binds with the enzymes 'beta lactamase' produced by gram +ve and gram -ve bacteria irreversibly and blocks their hydrolytic activity.

**Indication**

Cattle/horse/sheep/goat/pig/dog/cat: Mastitis, Hemorrhagic septicemia, Pneumonia, Peritonitis, Skin and soft tissue infections, cystitis, pyometra, osteo arthritis, actinobacillosis, endometritis, pre operative prophylaxis, post operative treatment.

**Dosage**

Large animal: 5 – 10 mg/kg BW IM, IV, SC

Small animals: 15-25mg/kg BW IM, IV, SC

**Contraindication**

Avoid in animals with the history of hypersensitivity to penicillin and cephalosporin. Concomitant uses with calcium containing solutions have caused fatal calcium-ceftriaxone precipitates in lungs and kidneys. Do not mix with calcium or administer calcium-containing solutions or products within 48 hours of ceftriaxone administration

Brand Name	Manufacturer	MAH	Presentation
Wocef	Vetoquinol	Karma PMS	Ceftriaxone 3g+Tazobactam 375mg/vial (10ml)
Efectal	Neon Laboratories	KMT PMS	Ceftriaxone 500mg / vial, 4.8 vial.

**1.6. Levofloxacin****Class**

Quinolone antibacterial

**Action**

Exerts bactericidal effect by inhibiting the bacterium enzymes (bacterial topoisomerase and DNA gyrase) required for DNA replication, transcription, repair and recombination in bacteria.

**Indication**

Gastro-intestinal infections, Respiratory tract infections, Genital tract infections, urinary tract infection, Skin and soft tissue infections.

**Dosage**

Cattle: 1.5 mg/kg BW IM

5mg/kg BW OD IV

## Precaution

The use is restricted in animals as they are critically important antibiotic for human given the importance of AMR.

Brand Name	Manufacturer	MAH	Presentation
Meriflox	Vetoquinol	Karma PMS	Levofloxacin 100mg/ml, 15ml vial
Livosafe	Safecon lifesciences	KMT PMS	Enrofloxacin 100mg/ml, 15ml vial

## 1.7. Oxytetracycline LA/Oxytetracycline SA

### Class

Tetracycline congener

### Action

Oxytetracycline has bacteriostatic action as it inhibits bacterial protein synthesis by reversibly binding with 30s & 50s ribosomal subunits of susceptible organisms.

### Indication

**Cattle/buffalo:** HS, BQ, anthrax, pneumonia, enteritis, genitor urinary tract infections, wound infections, mastitis, brucellosis.

**Sheep/goat:** Pneumonia, enterotoxaemia, CCBP, brucellosis.

**Horse:** Pneumonia, strangles, enteritis, wound infections, joint ill, anthrax, brucellosis, genitor-urinary tract infections.

**Dog/cat:** Rickettsiosis, pneumonia, infectious enteritis, secondary bacterial complications due to viral diseases.

**Pig:** Scours, leptospirosis, joint ill, pneumonia, atrophic rhinitis.

**Poultry:** RTI, gastrointestinal infections, CRD, coryza, fowl cholera, blue comb.

### Dosage

Cattle/sheep/goat/horse: 5-10mg/kg BW/day IM, IV

Dog/cat: 10-20mg/kg BW/day (OTC-SA) IM, IV

Follow up for OTC-LA injection after 3-4 days.

### Contraindication

Avoid in pregnant animals as it causes congenital malformations or embryo-toxicity. Avoid in lactating animal.

***Oxytetracycline LA is contraindicated in dogs, cats and horses.***

Avoid concomitant usage with methotrexate as it results in fatal nephrotoxicity.

**Precaution**

Oxytetracycline and tetracycline given to young animals can cause discoloration of bones and teeth. High dosages or chronic administration may delay bone growth and healing. High oral doses given to ruminants can cause ruminal microflora, depression and ruminoreticular stasis.

Rapid intravenous injection of undiluted OTCs can cause intravascular hemolysis with resultant hemoglobinuria. Rapid intravenous injection of tetracyclines can induce transient Collapse and cardiac arrhythmias.

Avoid use along with the products containing Divalent or Trivalent Cations (oral antacids, saline cathartics or other GI products containing aluminum, calcium, iron, magnesium, zinc, or bismuth cations). When orally administered, tetracyclines can chelate these cations and can decrease the absorption of the tetracycline or the other drugs.

***It is recommended that all oral tetracyclines be given at least 1 – 2 hours before or after the cation-containing products.***

Brand Name	Manufacturer	MAH	Presentation
Bioxy- LA (20%)	BIO PHARMA Pvt Limited	KGT PMS	Oxytetracycline 200mg/ml, 30ml vial
Bactoject (5%)	Provet Pharma Pvt Limited	Karma PMS	Oxytetracycline 5%/ml, 50ml vial

**1.8. Penicillin G**

**Class**

Natural Penicillin

**Action**

Exerts bactericidal effect through inhibition of biosynthesis of cell wall peptido glycan of the susceptible microorganisms, rendering the cell wall osmotically unstable

**Indication**

Infections caused by *Streptococci*, *Clostridia*, *Corynebacterium*, *Bacillus anthracis*, and *Actinomyces bovis*.



**Dosage**

All animals: 10,000 – 50,000 IU BID IM, SC

**Contraindication**

Avoid in animals hypersensitive to penicillin and beta lactam antibiotics.

Avoid penicillin in guinea pigs, hamsters & chinchillas.

Procaine penicillin G shouldn't be used with sulphonamides (procaine antagonizes the effect of sulphonamides)

**Precaution**

600mg of penicillin G sodium contains 1.7mEq of Na<sup>+</sup>, use cautiously in animals with sodium restricted intake.

Do not use concomitantly with bacteriostatic antibiotics.

Excreted in milk.

Brand Name	Manufacturer	MAH	Presentation
Penicillin G procaine with aluminum stearate	Zydus AH	Karma PMS	Penicillin G procaine 3 lacs IU/ml, 10ml vial

**1.9. Streptomycin****Class**

Aminoglycoside and mainly active against aerobic and gram-negative bacteria. Streptomycin and dihydrostreptomycin and included in this group and they are both narrow spectrum aminoglycosides.

**Action**

It has bactericidal action. It inhibits protein synthesis by binding with 30s subunit of the bacterial ribosome, this leads to the codon misreading and eventual inhibition of protein synthesis. It is effective against gram negative bacteria.

**Indication**

Cattle/buffalo: Pasteurellosis, salmonellosis, brucellosis, actinomycosis, actinobacillosis, bovine tuberculosis, abortion.

Horse: Brucellosis, Glaser's disease, pink eye, poll eve.

Sheep/goat: Brucellosis, abortion, erysipelas.

Pig: Swine erysipelas, pasteurellosis, enzootic pneumonia.

Dog: Leptospirosis, brucellosis.

**Dosage**

Cattle/sheep/goat/horse/buffalo/pig: 10mg/kg BW  
 Dog: 10-25mg/kg BW OD.

**Contraindication**

Do not use in cats as they are particularly sensitive to toxic vestibular effects.

Do not use in pregnant animals as it results in fetal auditory toxicity and neuro-muscular paralysis.

**Precaution**

Aminoglycosides are ototoxic and nephrotoxic, prolonged or over dosage will damage in auditory mechanism.

Concomitant use with cephalosporins will increase the risk of nephrotoxicity.

Brand Name	Manufacturer	MAH	Presentation
Abmistryn	Abbot health care ltd	KMT PMS	Streptomycin 1g/vial

**1.10. Strepto-Penicillin****Class**

Combination of procaine penicillin and streptomycin (aminoglycoside)

**Action**

Streptomycin inhibits protein synthesis and penicillin interferes with bacterial cell wall synthesis.

**Dosage**

Add 7.5ml of distilled water into the vial and make it to 10ml. The recommended daily dose is 8mg procaine penicillin and 10mg streptomycin sulphate. IM route.

*(Refer product inserts for dosage and details)*

**Indication**

Against a wide variety of organisms including *Pasteurella*, *Klebsiella*, *Corynebacterium*, *Erysipelothrix*, *Listeria*, *Salmonella*, *Streptococci* and *Staphylococci*.

**Contra-indication**

Avoid using in animal with hypersensitivity to penicillin. Avoid concurrent usage with the drugs having ototoxic and nephrotoxic effects. Avoid in pregnant animals.

Brand Name	Manufacturer	MAH	Presentation
Dicrysticin-S	Zydus	Karma PMS	Streptomycin sulphate 2.5g + Procaine penicillin G 15,00,000 IU + Penicillin G sodium 5,00,000 IU per vial, 10ml vial

**1.11. Sulphadimidine****Class**

Sulphonamide

**Action**

It interferes with PABA in the folic acid pathway, which is important in nuclear material synthesis during the development of coccidial second generation schizont. It has bacteriostatic action.

**Indication**

Cattle/buffalo/sheep/goat/poultry: Intestinal and caecal coccidiosis. It is the drug of choice for hemorrhagic septicemia in cattle.

**Dosage:** Initial dose: 200mg/kg BW  
Maintenance dose: 100mg/kg

**Contraindication**

Contraindicated in animals with hypersensitivity to sulphonamides. Prolong or over dosage will lead to adverse reactions like muscle weakness, ataxia, blindness, and collapse. GI disturbances, in addition to nausea and vomiting may be seen too.

**Precaution**

Avoid concurrent use of antacids and phenytoin. Sulfonamide solutions are incompatible with calcium- or other polyionic-containing fluids. Route of administration should be followed as per the direction of the manufacturer.

Brand Name	Manufacturer	MAH	Presentation
Sulphadimidine inj.	Jackson Laboratories	Karma PMS	Sulphadimidine sodium 33.33 w/v, 100ml vial
Sulpha Bolus	Zydus AHL	Vetline PMS	5g/ bolus

### 1.12. Trimethoprim & Sulphadiazine/Sulphamethoxazole & Trimethoprim

#### Class

Potentiated sulphonamide antibiotic

#### Action

Sulphonamides have bacteriostatic effect and trimethoprim has bactericidal effect. Potentiated sulphonamides have bactericidal effect. Sulphonamide interferes with the PABA in the folic acid pathway, which is important in nuclear material synthesis of microbes. Trimethoprim inhibits the enzyme dihydrofolate reductase which is required to reduce dihydrofolic acid to tetrahydrofolic acid.

#### Indication

**Cattle/horse/sheep/pig:** Bacterial scours, systemic infections, bacterial pneumonia, calf diphtheria, post parturient bacterial infections, urogenital tract infections, gastro enteritis, upper and lower respiratory tract infection.

**Birds:** Respiratory and enteric bacterial infections, coccidiosis, toxoplasmosis.

**Dog:** Urinary tract infections, soft tissue infections, pyoderma, protozoal diseases (toxoplasma, Hepatozoan, Neospora), coccidiosis.

**Cat:** Urinary tract infection, toxoplasmosis.

#### Dosage

Dog/cat: 15mg/kg BW q 12hrs PO or 30 mg/kg BW q 24hrs PO.

Cattle: 25mg/kg BW q 24hrs IM/IV

Horse: 22mg/kg BW q 24hrs IV, 30mg/kg BW q 24hrs PO.

#### Contraindication

Avoid in animals with kerato conjunctivitis sicca condition and pregnant animals. Avoid in animals hypersensitive to sulphonamides and in animals showing marked liver parenchymal damage and blood dyscrasias.

### Precaution

Potentiated sulphonamides may cause hypothyroidism in dogs. Hypersensitive reactions are seen in large dog breeds (Doberman Pinschers are more susceptible). Avoid concurrent administration with antacid, keep at least 2hrs gap between administration of the two drugs. Hypersalivation, leucopenia, anemia and drowsiness are seen in cats.

Brand Name	Manufacturer	MAH	Presentation
Biotrim-Tm	Zoetis	KMT PMS	Sulphadiazine 400mg + Trimethoprim 80mg per ml, 30ml vial
Zinaprim-DS	Jackson Laboratories	Karma PMS	400 mg+2 gm/gm, 4 boli/strip
Safeprim	Safecon Lifesciences	Paras PMS	400mg+80mg/gm, 100gm sachet

### 1.13. Ampicillin

#### Class

Amino penicillin

#### Action

Inhibits the synthesis of bacterial cell wall. It has bactericidal action.

#### Indication

Cattle/buffalo/horse/sheep/goat/pig/dog/cat: Respiratory tract infection, urinary tract infection, gastro genital, soft tissues and skin infections, otitis, pneumonia, pharyngitis, mastitis, metritis, synovitis.

#### Dosage

Cattle/sheep/goat/horse/pig: 5-10mg/kg BW QID IM, IV, SC

Dog/cat: 20mg/kg BW QID PO, 10mg/kg BW IM, IV, SC.

#### Contraindication

Avoid in animal hypersensitive to penicillin. Avoid in the animal with the history of hypersensitivity to Cephalosporin. Do not use in rabbits, guinea pigs and hamsters.

#### Precaution

Avoid concurrent use with bacteriostatic antibiotics eg: Tetracycline,

chloramphenicol etc. Excreted in milk.

Brand Name	Manufacturer	MAH	Presentation
Ampicillin	Pure pharma	Paras PMS	500/ vial
Kd Cillin	Kabra	Paras PMS	250mg

### 1.14. Enrofloxacin

#### Class

Fluoroquinolone

#### Action

It inhibits the enzyme DNA gyrase of microbes which is responsible for coiling and super coiling of DNA producing bactericidal effect.

#### Indication

**Cattle/buffalo/sheep/goat:** Acute and chronic mastitis, respiratory tract infections, pneumonia, hemorrhagic septicemia, black quarter, pyometra, metritis, joint ill, uro genital infections, otitis, brucellosis, salmonellosis, wooden tongue.

**Horse/pig/dog/cat:** Urinary tract infections, gastro intestinal infections, coli septicemia, wound, uro genital infections, broncho pneumonia, secondary bacterial infections associated with viral diseases.

**Poultry:** CRD, colibacillosis, infectious coryza, pasteurellosis, salmonellosis, fowl typhoid, foal cholera, other mixed bacterial infections.

#### Dosage

Cattle/sheep/goat/buffalo/pig: 2-5mg/kg BW OD SC for 3-5 days  
7.5mg-12.5mg/kg BW single dose SC.

Dog/cat: 2.5 - 5mg/kg BW divided doses.

Poultry: 15-20mg/kg BW IM

100-200mg/litre of drinking water.

#### Contraindication

Due to its Arthropathic effect, do not give in small breed dogs below 1 year of age, large breed dogs below 18 months of age and cats below 8 months of age.

#### Precaution

Do not administer Fluroquinolone drugs along with absorbents and

antacids containing cations together, maintain at least 2 hours administration gap between them. Use cautiously in cats as it causes irreversible retinal blindness. Do not administer to lactating or pregnant animal (arthropathic effect on fetus and young ones).

Brand Name	Manufacturer	MAH	Presentation
Enrovet	Vetsfarma Ltd	KMT PMS	Enrofloxacin 100mg/ml, 30 ml vial
Enroflame	Pet Bovine Animal Health	Paras PMS	Enrofloxacin 150mg/tab

### 1.15. Amikacin

#### Class

Semi-synthetic Aminoglycoside

#### Action

It inhibits protein synthesis by irreversible binding with 30s ribosome of the microbes. It has bactericidal action.

#### Indication

Local and systemic infections caused by bacteria such as septicemia, trachea-bronchitis, osteoarthritis, UTI, GI infections, wounds and skin infections, other resistant infections.

#### Dosage

Horse: 15-25mg/kg OD

Cattle: 10mg/kg BW TID, 25mg/kg BW BID.

Dogs: 10mg/kg BW BID/TID, 15-20mg/kg BW OD.

Birds: 15mg/kg BW IM/ IV/SC.

#### Contraindication

Avoid concomitant use with drugs having ototoxic and nephrotoxic effect e.g. cephalosporin, diuretics etc. Avoid in pregnant cows and in cows prone to milk fever. Avoid concomitant use with general anesthesia and neuromuscular blocking agents.

#### Precaution

Monitor renal functions while the patient is under aminoglycoside therapy. Concurrent intravenous fluid therapy is advisable. Prolonged or over

dosage will lead to ototoxicity and nephrotoxicity.

Brand Name	Manufacturer	MAH	Presentation
Amicaject	Provet	Karma PMS	250mg/ml, 5ml vial.
Amibiotic	Neon Lab	Karma PMS	250 mg/2ml, 2ml vial.

### 1.16. Cefotaxime

#### Class

Third generation cephalosporin

#### Action

Inhibits bacterial cell wall synthesis by inactivating trans-peptidase enzyme.

#### Indication

Respiratory tract infection, urinary tract infection, localized infections in skin and tissues, intra abdominal infections, tuberculosis

#### Dosage

Dog/cat: 20-50mg/kg BW BID IM, IV, SC

Horses: 40mg/kg BW QID

Foal: 15-30mg/kg BW QID

Birds: Adult - 75mg/kg BW TID; Young - 25mg/kg BW TID

#### Contraindication

Avoid using in animals hypersensitive to cephalosporin and penicillin.

Avoid concomitant with drugs having nephrotoxic effect e.g. Cephalosporin, loop diuretics etc.

#### Precaution

Avoid concomitant use with bacteriostatic drugs. Monitor the patient with diminished renal function.

Brand Name	Manufacturer	MAH	Presentation
Evacef	Neon	KMT PMS	Cefotaxime 1g/vial, 4ml vial



## 1.17. Erythromycin

### Class

Macrolide antibiotic

### Action

Inhibits protein synthesis by binding to 50s ribosomal units of the susceptible bacteria. It has bacteriostatic effect but on high concentrations, it has bactericidal effect. It is mainly used against penicillin resistant infections.

### Indication

Cattle/buffalo/sheep/goat: Actinomycosis, abortion, mastitis, urinary tract infection, pyometra, black quarter.

Horse: Glasser's disease, pink eye, pyoderma.

Pig: swine erysipelas, enzootic pneumonia.

Dog/cat: Bacterial pharyngitis, otitis, bronchitis, pneumonia, amoebic dysentery, abortion, sinusitis, brucellosis, feline pneumonia, pyoderma.

Birds: CRD, Ornithosis, infectious synovitis, infectious coryza.

### Dosage

Cattle: 4-8mg/kg BW q 12-24hr.

Horse: 15-25 mg/kg BW q 12-24hr.

Dog/cat: 10-20mg/kg BW PO q 8-12hr.

Birds: 20mg/kg IM/SC q 8hr, 60mg/kg PO q 12hr.

### Contraindication

Contraindicated in animals with hepatic and renal impairments. Erythromycin shouldn't be used along with other macrolide, chloramphenicol and lincosamide as antagonism may occur. Do not use in adult horse. Contraindicated in pregnant animals (teratogenic effect) and in rodents and rabbits.

### Precaution

Avoid administration of oral preparation to the ruminants as it may result in severe diarrhea.

Brand Name	Manufacturer	MAH	Presentation
Erythromycin	NA	NA	500mg/ml, Vial

## 1.18. Gentamicin

### Class

Aminoglycoside

### Action

It inhibits protein synthesis by irreversibly binding to 30S ribosomal subunit of the susceptible microbes. It has bactericidal action.

### Indication

**Cattle/buffalo/sheep/goat:** Mastitis, metritis, wound infection, urinary tract infection, pyometra, otitis, pneumonia, ocular infection.

**Pig:** Baby pig scours, enzootic pneumonia gastro enteritis, urinary tract infection, mastitis- metritis agalactia (MMA) syndrome.

**Dog/cat:** Urinary tract infection, respiratory tract infection, gastro intestinal tract infection, otitis externa, ocular infections.

**Bird:** CRD complex, wing rot, colibacillosis, egg dip in to prevent mycoplasmosis.

### Dosage

Cattle: 4.4-6.6 mg/kg BW TID IM, SC

Dog/cat: 2-4mg/kg BW BID, 6-8mg/kg BW parental route OD IM, SC, IV

Horse: Adult- 6.6mg/ kg BW q18-24hr, Foal- 7mg/kg q 24hr IM, SC

Pig: 5mg/kg BW OD IM, SC

Birds: 5mg/kg BW OD IM, SC

### Contraindication

Contraindicated in pregnant animal as it crosses placental barrier leading to renal impairment and ototoxicity of the fetus. Avoid concomitant usage with drugs having nephrotoxic effect. Avoid aural preparation if tympanum is perforated. Do not use in the animals with neuromuscular impairment.

### Precaution

Avoid using in animals prone to milk fever

Brand Name	Manufacturer	MAH	Presentation
Gentaject	Provet Pharma Pvt Ltd	Karma PMS	Gentamicin 40mg/ml, 30ml vial.

## 1.19. Metronidazole

### Class

Synthetic nitro-imidazole and has antiprotozoal and antibacterial actions.

### Action

It inhibits nucleic acid synthesis by disrupting the DNA of microbial cells.

### Indication

Dog/cat: Intestinal amoebiasis, trichomoniasis, giardiasis, gingivitis, empyema, *Balantidium* infections and other anaerobic infections.

Horse: Anaerobes infections.

### Dosage

Dog: 20mg/kg BW/day in divided doses IV, 25-50mg/kg BW PO in divided doses.

Horses: 20-25mg/kg q12h, IV, IM, Oral

Cat: 25mg/kg/day in divided doses.

### Contraindication

Avoid usage in animal hypersensitive to nitroimidazole derivatives. Avoid usage in severely debilitated animals, pregnant and nursing animals. Avoid use in large animals as it is carcinogenic.

### Precaution

Avoid concomitant usage with cimetidine. Use with caution in the animals with hepatic dysfunction. Adverse reactions like nausea, vomiting, diarrhea, nervous disorders, depression, lethargy, salivation etc are seen.

Brand Name	Manufacturer	MAH	Presentation
Metrogyl 400	J.B Chemicals & Pharmaceuticals	KMT PMS	Metronidazole 400mg/ tab
Metro 0.5%	Pentrgod Labs Ltd	KMT PMS	0.5g/100ML, 100ml bottle
MF-3	Ukay Remedys Pvt. Ltd	KMT PMS	Metronidazole 1000mg + Loperamide 7.5mg/bolus

## 1.20. Tetracycline Hydrochloride (Water soluble powder 5g/100g)

### Class

Tetracycline

### Action

Inhibits the protein synthesis of the susceptible microbes and has bacteriostatic effect.

### Indication

For prevention and treatment of a wide variety of infections of the respiratory, GI, genital and urinary tract in large & small animals and birds.

### Dosage

**Dog:** UTI – 16mg/kg BW q 6-8hrs

Rickettsiosis – 22mg/kg BW q 6-8hrs

**Cat:** Soft tissue infections: 20 mg/kg PO q8h for 21 days

Hemotropic mycoplasmosis: 10 – 25 mg/kg PO q8 – 12h for 21 days;

Rickettsial diseases: 16 mg/kg, PO q 8hrs

**Cattle:** 11 mg/kg, BID PO

**Sheep:** 11 mg/kg, BID PO

**Pig:** 22 mg/kg, PO

### Contraindication

Avoid in animals hypersensitive to tetracycline, pregnant animals (First and second trimesters in cattle and all three trimesters in dogs and cats) and concomitant use with the drugs having hepatotoxic and nephrotoxic effect.

### Precaution

High oral doses given to ruminants can cause ruminal microflora, depression and ruminoreticular stasis.

Brand Name	Manufacturer	MAH	Presentation
Tetracycline Hcl Pdr	Ukay remedies	KMT PMS	5gm/100gm sachet, 100gm sachet
Tetracycline Hcl+Erythromycin+Vitamin Pdr	Hester Biosciences	Medicocity (Direct)	Tetracycline 135g + Erythromycin 25g with Vitamins per kg, 100gm sachet

## 1.21. Doxycycline

### Class

Tetracycline congener

### Action

It inhibits protein synthesis of the microbes and has bacteriostatic action.

### Indication

Cattle/buffalo/sheep/goat: Respiratory tract infection, hemorrhagic septicemia, black quarter, anthrax, foot rot, wound infection, pneumonia, secondary bacterial infections due to viral diseases.

Dog/cat: Urinary tract infection, respiratory tract infection, bacterial enteritis, haemoprotozoan diseases, other septicemia diseases.

Birds: Bacterial infections.

### Dosage

Cattle/sheep/goat: 1-2mg/kg BW oral

Dog/cat: 5-10mg/kg BW/day oral

Horse: 10 mg/kg PO once to twice daily orally for up to 30 days (For Lyme disease)

### Contraindication

Contraindicated in patients hypersensitive to doxycycline, in pregnant animals and young pups.

### Precaution

Do not administer along with antacids, keep gap of 1-2 hrs

Brand Name	Manufacturer	MAH	Presentation
Doxysafe	Safecon lifesciences	Paras PMS	Doxycycline 50mg/tab

## 2. ANTHELMINTICS

### 2.1. Albendazole

#### Class

Benzimidazole

#### Action

Inhibits polymerizations of tubulin of the parasites and blocks the glucose uptake. At higher concentration it also interferes with enzyme fumarate reductase thus affecting energy production in the parasite. It is broad spectrum anthelmintic and has wormicidal, larvicidal and ovicidal action.

#### Indication

Cattle/buffalo/horse/sheep/goat/pig/dog/cat/poultry: Adult and larval stage of nematodal, cestodal and trematodal infestations.

#### Dosage

Cattle/horse/sheep/goat/pig: Nematode & Cestode - 5mg/kg BW PO, OD as single dose; Flukes – 15-20mg/kg BW  
Dog/cat: 25-50mg/kg PO, OD for 3-5 days

#### Contraindication

Avoid administration in the pregnant animal (first trimester), as it is embryo toxic and teratogenic.

Brand Name	Manufacturer	MAH	Presentation
Ashialben 150	Ashish life sciences	Vetline PMS	Albendazole 150/ bolus

### 2.2. Oxylozanide

#### Class

Salicylanilide

#### Action

It leads to energy depletion of the parasites by uncoupling the oxidative phosphorylation in the mitochondria of the parasite.

#### Indication

Cattle/buffalo/sheep/goat: Facioliasis, amphistomiasis, moneziasis.

## Dosage

Cattle/buffalo: 10-15mg/kg BW oral

Sheep/goat: 15mg/kg BW

(In acute cases the dose can be increased to 3 times provided the animal is not dehydrated)

## Precaution

Over dosage will lead to clinical signs like dullness, inappetance, softening of feces and diarrhea. These signs are enhanced in animals with severe liver damage and dehydration at the time of dosing.

Milking cattle particularly high yielders may occasionally show reduction in milk yield by 5% for about 48hrs after administration of the drug. Hence spreading herd dosing over the period of about one week is recommended to minimize the loss effect.

Brand Name	Manufacturer	MAH	Presentation
Flunil-L	Vetsfarma Ltd	KMT PMS	Oxyclozanide 1% + Levamisole 1% per ml
Zanil	Virbac	Karma PMS	3.4% W/V, 1 litre Jar

## 2.3. Rafoxanide + Levamisole

### Class

Salicylanilide (Rafoxanide), Imidothiazole (Levamisole)

### Action

Rafoxanide leads to energy depletion of the parasites by uncoupling the oxidative phosphorylation in the mitochondria of the parasite.

Levamisole causes spastic paralysis of the worms and also inhibits fumarate reductase enzyme affecting energy metabolism of the parasite.

Levamisole also stimulates cell mediated immunity in immunologically incompetent animals.

### Indication

Cattle/buffalo/sheep/goat: Trematodes and nematodes

### Dosage

Cattle/sheep/goat: 7.5mg/kg BW (Rafoxanide) +7.5mg/ kg (Levamisole) BW PO. (*Refer the product inserts*)

### Precaution

Over dosage may lead to inappetance, diarrhea and ocular dysfunction.

Brand Name	Manufacturer	MAH	Presentation
Anide-L	Vetindia pharmaceuticals	Vetline PMS	Rafoxanide 30mg + Levamisole HCL 15mg/ml, 1 lit jar.

## 2.4. Triclabendazole

### Class

Benzamidazole

### Action

It inhibits the polymerization of the tubulin of the parasites and blocks glucose uptake. It also interferes with enzyme fumarate reductase which is important in energy production. Energy level of the parasite diminishes and leads to death of the parasite.

### Indication

Cattle/buffalo/sheep/goat: Trematode infestations especially Fasciola spp.

### Dosage

Cattle/buffalo: 12mg/kg BW PO

Sheep/goat: 10mg/kg BW PO

### Precaution

It is ineffective against nematode.

Brand Name	Manufacturer	MAH	Presentation
Fasnash Cattle	Ashish Life Science Pvt Ltd	Paras PMS	Triclabendazole 900mg/ Bolus

## 2.5. Fenbendazole

### Class

Benzimidazole

### Action

Inhibits polymerization of the tubulins of the parasites and blocks glucose



uptake. It also interferes with the enzyme fumarate reductase and thus the energy production of the parasite. Energy level of the parasite diminishes resulting to the death of the parasite. Fenbendazole have wormicidal, larvicidal and ovicidal action.

*It has wide safety margin and non-embryotoxic.*

### **Indication**

Cattle/buffalo/horse/sheep/goat/pig/dog/cat/poultry: Nematodes, cestodes and trematodes

### **Dosage**

Cattle/sheep/goat/horse/pig: 5-7.5mg/kg BW single dose PO

Dog: 50mg/kg BW for three days PO

Cat: 30mg/kg BW for three days PO

Birds: 10-15mg/kg PO

Brand Name	Manufacturer	MAH	Presentation
Fencure 750	Ashisience Pvt Ltd Life Sch	Paras PMS	1.5gm bolus, 5 boli/strip
Triffen	Ukay Remedies	KMT PMS	25% W/V, 120gm jar

## **2.6. Levamisole HCL**

### **Class**

Imidothiazole

### **Action**

It stimulates the parasympathetic and sympathetic ganglia in susceptible worms. At higher levels, levamisole interferes with nematode carbohydrate metabolism by blocking fumarate reduction and succinate oxidation. The net effect is a paralyzing effect on the worm that is then expelled alive. Levamisole stimulates cell immediate immunity in immune compromised animals.

### **Indication**

Cattle/buffalo/horse/sheep/goat/pig/cat: Nematodes infestations and immune stimulant; Dog: Nematode infestation and microfiliariasis.

## Dosage

Cattle/buffalo/horse/sheep/goat/pig: Treatment: 7.5mg/ kg BW

Immuno stimulant: 2.5mg/kg BW

Dog: Hook worms: 5-8mg/kg PO once

Microfilaricidal: 10mg/kg PO for 10 days

Immuno stimulant: 0.5-2mg/kg 3times per week

Cat: Microfilaricidal: 10mg /kg BW PO for 7 days

Immuno stimulant: 0.5-2mg/kg BW

Lung worm: 20-40mg/kg PO, OD for 5 days

## Contraindication

It is contraindicated in lactating animals.

Levamisole is not indicated for use as a dirofilarial adulticide.

Avoid administration of levamisole intramuscularly to birds.

Contraindicated in pregnant animals.

Avoid concomitant use with chloramphenicol, pyrantel, morental, diethyl carbamazine.

## Precaution

Levamisole is considered to be more dangerous when administered

❖ Parenterally than when given orally or topically.

❖ Intravenous administration is particularly hazardous and is never recommended.

It should be used cautiously in animals that are severely debilitated, or significant renal or hepatic impairment.

Adverse effect will mimic the signs of organophosphate poisoning.

Brand Name	Manufacturer	MAH	Presentation
Lemasol-75	Zoetis	Karma PMS	Levamisole HCL 75mg/ml, 30ml vial.

## 2.7. Piperazine

### Class

Piperazine

### Action

It induces neuromuscular hyperpolarization in the worms producing reversible flaccid paralysis. This prevents the parasite from maintaining their position in the host gut and thus is excreted with feces.

## Indication

Cattle/buffalo/horse/sheep/goat/pig/dog/cat/birds: Gastro-intestinal nematodiasis.

## Dosage

Calf/horse/pig: 200-300mg/kg BW PO

Dog: Pups (weighing less than 2.5kg): 45-65 mg/kg (base) BW PO

Adult and pups weighing more than 2.5kg: 100-110mg/kg BW PO and repeat after 2-3 wks.

Cat: 45-65mg/kg (base) BW PO

Birds: 32mg/kg (base) BW PO

## NOTE:

*Piperazine is available in several salts (e.g. citrate, hexahydrate, chloride, etc) that contain varying amounts of piperazine base. Many of the doses listed above do not specify what salt (if any) is used in the dosage calculations. If the dose is in question, refer to the actual product information for the product you are using.*

## Contraindication

Contraindicated in animals with chronic liver or kidney disease, and those with gastrointestinal hypomotility. Contraindicated in horses with heavy infestations of *P. equorum*, rupture or blockage of intestines is possible due to the rapid death and detachment of the worm.

## Precaution

Piperazine and pyrantel/morantel have antagonistic modes of action and should generally not be used together. Use of purgatives (laxatives) with piperazine is not recommended as the drug may be eliminated before its full efficacy is established.

Brand Name	Manufacturer	MAH	Presentation
Pipzine	Ukay Remedies	KMT PMS	40%, 450ml bottle
Piperazine solution	Ukay remedies	Paras PMS	38% W/V, 120ml bottle

## 2.8. Niclosamide

### Class

Salicylinalide



**Action**

It uncouples oxidative phosphorylation in the mitochondria, which leads to energy depletion of parasites and the results in accumulation of lactic acid which becomes lethal to the parasite.

**Indication**

Cattle/buffalo/sheep/goat: Paramphistomiasis, cestodiasis.

Dog/cat/birds: Cestodiasis

Horse: Monezia infestations.

**Dosage**

Cattle/sheep/goat/horse: 50-500mg/kg BW

Dog/cat: 75-100mg/kg BW

Bird: 175mg/kg BW

Brand Name	Manufacturer	MAH	Presentation
NIMISIDE-500	Ukay remedy Pvt Ltd.	KMT PMS	Niclosamide 500mg/ tab

**2.9. Praziquantel****Class**

Pyrazino iso quinoline

**Action**

It initiates rapid muscular contraction of the cestodes by altering the ionic balance of the cell wall, causes vacuolation, spastic paralysis and disruption of its tegument. It also activates hosts defense mechanisms.

**Indication**

Dog/cat/bird/horse: Cestode infestations (adult & larva)

**Dosage**

Dog/cat: 5mg/kg BW PO

Bird: 5-10mg/kg BW PO

**Contraindication**

Contraindicated in puppies less than 4 weeks old or kittens less than 6 weeks old and contraindicated in dogs hypersensitive to the drug.

Brand Name	Manufacturer	MAH	Presentation
Prazi-Q	Ukay remedies	Paras PMS	50mg/tab, 50 tab/jar

## 2.10. Tetramisole

### Class

Imidothiazole (mixture of levo and dextro isomer of levomisole)

### Action

It stimulates the parasympathetic and sympathetic ganglia in susceptible worms. At higher levels, levamisole interferes with nematode carbohydrate metabolism by blocking fumarate reduction and succinate oxidation. The net effect is a paralyzing effect on the worm that is then expelled alive.

### Indication

Cattle/buffalo/sheep/goat: Mature and immature stages of gastrointestinal and pulmonary Nematode infestations and lung worms.

### Dosage

Cattle: 15mg/kg BW PO

Sheep/goat: 15-30mg/kg BW PO

Pig: 30-37mg/kg BW PO

### Contraindication

For 14 days after administration of tetramisole, animals should not be treated with organic compounds of phosphorous (Insecticides, acaricides, anthelmintics)

Avoid in severely debilitated, dehydrated and pregnant animal.

### Precaution

Concomitant use of the tetramisole with anthelmintics that act as nicotinic cholinometics (pyrantel) should be avoided.

Tetramisole is not ovicidal, immediately after the treatment of the animal with tetramisole the feces should be either be disposed or the animal must be moved to non infested pasture.

Brand Name	Manufacturer	MAH	Presentation
Ashitetra 30%	Ahish life science pvt ltd	Paras PMS	Each gram contains tetramisole HCL 30% w/w

## 2.11. Ivermectin

### Class

Avermectin prototype

### Action

Ivermectin enhances the release GABA at presynaptic neurons. GABA acts as an inhibitory neurotransmitter and blocks the post-synaptic stimulation of the adjacent neuron in nematodes or the muscle fiber in arthropods and worms resulting in flaccid paralysis.

### Indication

Cattle/buffalo/sheep/goat/horse/pig: Nematode infestations (gastro intestinal infestations, eye worms, lung worms), ectoparasites (tick, lice, mites, nasal bots in sheep and goat, cutaneous myiasis.

Dog: Microfilaria, ectoparsites including demodex, cutaneous myiasis.

### Dosage

Cattle/buffalo/sheep/goat/horse: 200mcg/kg BW (0.2mg/kg BW) SC

Dog: 100 mcg/kg (0.1mg/kg BW) SC

Cat: 24mg/kg BW (0.024mg/kg BW) SC

### Contraindication

Contraindicated in dog breeds like Collies, Australian Shepherds, Shelties, long-haired Whippet etc.

Not recommended for use in puppies less than 6 weeks old.

Intravenous and intramuscular administration should not be done.

### Precaution

Ineffective against trematodes, cestodes and adult canine heart worms

Horses: Swelling & pruritis at the ventral mid-line can be seen approximately 24 hours after ivermectin administration due to a hypersensitivity reaction to dead *Onchocerca* spp and microfilaria.

Dogs: May exhibit a shock like reaction when ivermectin is used as a microfilaricide, presumably due to a reaction associated with the dying microfilaria.

Cattle: Ivermectin can induce serious adverse effects by killing the larva when they are in vital areas; may also cause discomfort or transient swelling at the injection site.

Brand Name	Manufacturer	MAH	Presentation
Safetal-L	Safecon life sciences	Paras PMS	Closantel 125mg + Ivermectin 5mg/ml, 20ml vial
Parid	Vetsfarma	KMT PMS	Ivermectin 10mg/ml, 10ml vial

## 2.12. Praziquantel + Pyrantel pamoate + Febantel

### Class

Pyrazino iso quinoline (Praziquantel) + Pyrimidine (Pyrantel pamoate) + Febantel is derivative of pyrantel.

### Action

Praziquantel initiates rapid muscular contraction by altering the ionic balance of muscle cell of the parasites.

Pyrantel pamoate and Febantel is depolarizing neuromuscular blocking agent in nematodal parasite and vertebrate host. Both of them thus produce spastic paralysis.

### Indication

Dog/cat/horse: Nematodal infestations

### Dosage

Dog: 5mg/kg praziquantel + 5mg/kg Pyrantel pamoate + 15mg/kg Febantel

Cat: 5mg/kg praziquantel + 20mg/kg pyrantel pamoate

**Note:** Refer the product literature; dosage can be given as per the manufacturers' directives.

### Precaution

Pyrantel pamoate alone should not be used in pups below 2 months of age and in the pups with body weight below 1 kg. Some manufacturers recommend use of pyrantel pamoate in combination with other anthelmintics in pups below 2 month of age.

Brand Name	Manufacturer	MAH	Presentation
Zerokrim CH	Ashish Life Science Pvt Ltd	Paras PMS	Praziquantel 50mg + Pyrantel Pamoate 144mg + Fenbendazole 500mg per tab

## 3. EXTERNAL PARASITICIDES

### 3.1. Amitraz

#### Class

Tri azeidentadiene

#### Action

It increases neuronal activity through its action on octapamine receptors of the parasites.

#### Indication

Cattle/buffalo/sheep/goat: Hump sore, earsore, tail sore, tick, lice, flea, ked, mites.

Dog: generalized demodicosis, sarcoptic acariasis, infestations of tick, lice, and fleas.

#### Dosage (*As directed by the manufacturer*)

#### Contraindication

Do not use in pups less than 3 months of age. Contraindicated in cats, chihuahuas and diabetic animals. Contraindicated in horses.

#### Precaution

Harmful on ingestion for both men and animals and irritating to eyes. Wash hands thoroughly before eating, drinking or smoking after work.

Brand Name	Manufacturer	MAH	Presentation
Ramitraz 5%	Ramachandra	KMT PMS	Amitraz 5% w/v, 60ml bottle

### 3.2. Cypermethrin

#### Class

Synthetic Pyrethroid

#### Action

They act on basal ganglia of the CNS and produces rapid paralytic action on the insects, preceded by muscular excitation and convulsions.



**Indication**

Used to control ectoparasites (Ticks, mites, fleas, lice etc).

**Dosage (As indicated by the manufacturer)****Precaution**

Avoid direct contact with eyes and skin while using the drug. Avoid licking by the animal. Cypermethrin is classified as carcinogen; avoid careless use of the drug.

Brand Name	Manufacturer	MAH	Presentation
Clinar	Virbac	Karma PMS	Cypermethrin 10% w/v, 1L jar

**3.3. Deltamethrin****Class**

Synthetic Pyrethroid

**Action**

They act on basal ganglia of the CNS, causing repetitive nerve action through prolongation of sodium permeability during the recovery phase of the action potential of the neurons. It produces rapid paralytic action on the insects, preceded by muscular excitation and convulsions.

**Indication**

Used to control ectoparasites

**Dosage (As indicated by the manufacturer)****Precaution**

Avoid direct contact with eyes and skin while using the drug. Deltamethrin is classified as carcinogen; avoid careless use of the drug. Avoid licking by the animal.

Brand Name	Manufacturer	MAH	Presentation
Yentox 125 D	Ramachandra	KMT PMS	Deltamethrin 12.5% w/v, 1L jar

### 3.4. Flumethrin

**Class**

Synthetic pyrethroid

**Action**

It is absorbed by the sensory organs and body of the parasites. Nerve signals are abolished by keeping sodium channel open thus causing marked over excitation with tremors and spasms, followed by paralysis and death.

**Indication**

To control ectoparasites

**Dosage (*As indicated by the manufacturer*)****Precaution**

Avoid direct contact with eyes and skin while using the drug. Avoid licking by the animal. Flumethrin is classified as carcinogen; avoid careless use of the drug.

Brand Name	Manufacturer	MAH	Presentation
Flupor	Zoetis	Karma PMS	Flumethrin 10mg/ml, 30ml vial.

## 4. ANTIFUNGALS

### 4.1. Clotrimazole

**Class**

Imidazole (Topical)

**Action**

It inhibits ergosterol synthesis altering cell wall permeability.

**Indication**

Fungal infections caused by dermatophytes, aspergillus and yeasts

**Dosage**

As topical application (Refer product insert)

Brand Name	Manufacturer	MAH	Presentation
Clotrimazole 1%	Galentic Pharma Pvt Ltd	Medicocity (Direct)	Clotrimazole 10mg /g , 15g tube
Clotrimazole I.P	SRIDEEP pharma.	KMT PMS	Clotrimazole 1% w/w, 15g tube

### 4.2. Griseofulvin

**Class**

Fungistatic antibiotic

**Action**

It interferes with polymerization of the microtubular protein into microtubules of dermtophytes.

**Indication**

Cattle/buffalo/dog/cat: Trichophyton, Microsporum spp.

**Dosage**

Cattle: 7.5-10mg/kg BW/day for 30 days.

Dog/cat: 20mg/ kg BW for 30 days.

Pig: 20 mg/kg PO once daily for 6 weeks

Horse: 10 mg/kg PO (in feed) daily for 7 days

### Contraindication

Contraindicated in pregnant animals (teratogenic effect).  
Contraindicated in animals with diminished hepatic function.  
Kittens are highly susceptible to the adverse effects of griseofulvin.

### Precaution

Griseofulvin should be given after fatty meal for better absorption.

Brand Name	Manufacturer	MAH	Presentation
Grisonex	Combitic Global Caplet Pvt. Ltd	Medicocity (Direct)	Griseofulvin 250mg/tab, 10 tab/strip

## 4.3. Ketoconazole

### Class

Imidazole

### Action

Inhibits ergosterol synthesis resulting in disturbance of fungal cell membrane function and damages at higher concentration.

### Indication

Dog/cat: Aspergillosis, Coccidiomycosis, Dermatomycosis, histoplasmosis, Blastomycosis, Cryptococcosis, Malassezia dermatitis, alternative treatment of hyperadrenocorticism in dogs.

Birds: Aspergillosis, Coccidiomycosis, Dermatomycosis, histoplasmosis, Blastomycosis, Candidiasis

### Dosage

Dog/cat: 5-10mg/kg BW q 8-12hrs PO

Hyperadrenocorticism: 5mg/kg BW q 12hrs PO for 7 days, increase to 10mg/kg BW q 12 hrs Po for 14 days id no adverse reaction are seen.

Bird: 25-30mg/ kg BW q 12 hrs PO.

### Contraindication

Contraindicated in patients with known hypersensitivity to ketoconazole and in pregnant and lactating animals.

**Precaution**

It should be used with caution in patients with hepatic disease or thrombocytopenia.

Antacid may reduce oral absorption of ketoconazole. Administer ketoconazole at least 1 hour before or 2 hours after.

Avoid concomitant administration of ketoconazole with H2 blockers, proton pump inhibitors, Ivermectin, macrolide antibiotics, sucralfate, Vincristine etc.

Brand Name	Manufacturer	MAH	Presentation
Fungicide	Torrent Pharma	Karma PMS	Ketaconazole 200mg tab, 10 tab/strip

## 5. ANTIPROTOZOALS

### 5.1. Buparvaquone

**Class**

Hydroxynaphthoquinone (Anti-theilerial)

**Action**

It blocks the mitochondrial electron transport thereby inhibiting ATP and pyrimidine biosynthesis in susceptible protozoa. It is active against the schizont and piroplasmal stage of the theileria.

**Indication**

Theileriosis

**Dosage**

Cattle/buffalo: 2-5mg/kg BW IM

**Contraindication**

Administration by intravenous or subcutaneous route is contraindicated

**Precaution**

Not more than 10ml should be injected at the single site. Follow aseptic measure while administration of the drug. Localized, painless, and edematous swelling may be seen at the site of injection

Brand Name	Manufacturer	MAH	Presentation
Butawock	Vetoquinol	Karma PMS	50mg/ml, 20ml vial

### 5.2. Diminazene Aceturate

**Class**

Anti haemoprotozoal

**Action**

It affects the phospholipids synthesis. It is said to displace magnesium ion and it inhibits polyamines in the parasite. The drug interferes with glycolytic pathway of the parasite.

**Indication**

Cattle/sheep/goat/horse/dog: Trypomosomiasis, babesiosis.

### Dosage

Cattle: 3.5mg/kg BW IM once (**Do not exceed 8g per animal**)

Dog: Babesiosis- 3.5-5 mg/kg BW IM q 24hrs

Trypanosomiasis- 3.6-7mg/kg IM repeat after 14 days.

### Precaution

Adverse effect in dogs may include vomiting and diarrhea, pain and swelling at the injection site, and transient decreases in blood pressure. Ataxia, seizures or death have been reported in rare cases.

Brand Name	Manufacturer	MAH	Presentation
Prozomin	Virbac	Karma PMS	Diaminazene 70 mg + Promazon 375mg/ml, 30ml vial

## 5.3. Quinapyramine

### Class

Anti haemoprotozoals

### Action

The drug binds avidly to proteins and inhibits many enzymes involved in energy metabolism. It also distorts the intracellular membrane in lysosomes.

### Indication

Cattle/buffalo/sheep/goat/pig/dog: Trypanosomiasis; Horse: Surra

### Dosage

Cattle: 12mg/kg BW; Horse: 7-10mg/kg BW

### Precaution

Over dosage may produce signs like trembling, sweating and salivation. Massage the site of injection to reduce the local tissue damage.

Brand Name	Manufacturer	MAH	Presentation
Triquin	Vetoquinol	Karma PMS	Q'pyramine SO4 1.5g + Q'pyramine Cl 1g/20ml, 2.5g vial.

## 6. RUMENOTORICS

### 6.1. Antimony Potassium Tartarate + FeSO<sub>4</sub> + CoSO<sub>4</sub> + CoCL

#### Class

Rumenotorics (Allopathic drug)

#### Indication

Cattle/buffalo/sheep/goat:

- ❖ Ruminal stasis/indigestion caused by moldy feeds, indigestible roughages, low protein diet and over eating.
- ❖ Anorexia and sudden drop in milk production

#### Dosage

Sheep – ½ to 1 bolus per day orally

Cattle and buffaloes – 3-4 boli per day orally

#### Contraindication

Only for ruminants and NOT for other species of animals.

#### Precaution

Take due care when administered to emaciated animals.

Do not exceed recommended dose.

Do not prolong the treatment.

Provide plenty of drinking water.

Brand Name	Manufacturer	MAH	Presentation
Bovirum Bolus	Zydus Animal Health	Karma PMS	Each bolus contains Antimony potassium tartarate 2g, Dried ferrous sulphate 2g, Copper sulphate anhydrous 50mg, Cobalt Chloride 100mg, 4 boli/strip



## 7. ANTACIDS

### 7.1. Aluminum Hydroxide & Dimethyl Polysiloxane

#### Class

Antacid

#### Action

Aluminum hydroxide binds neutralizes gastric gastric juice. It also binds with the bile acids and pepsin. It also stimulates the production of prostaglandin- I, binds with the inorganic phosphate in the gastrointestinal tract making it available for absorption. Dimethyl Polysiloxane acts as defoaming agent as well as local and systemic antacid.

#### Indication

Cattle/buffalo/sheep/goat: Ruminal stasis due to grain overload.

Dog: Gastritis, reflux oesophagitis, peptic ulcers, gastric hyperacidity, dyspepsia.

**Dosage:** (*Refer the product inserts*)

#### Precaution

Avoid administration of tetracycline, fluoroquinolone and digoxin within 2 hrs orally.

Brand Name	Manufacturer	MAH	Presentation
Megacid	Jackson Laboratories Pvt Ltd.	Karma PMS	Each 5ml contains Aluminum Hydroxide 250mg + Magnesium Hydroxide 250mg + Simethicone 40mg, 450ml Bottle

### 7.2. Omeprazole

#### Class

Proton pump inhibitor

#### Action

It irreversibly binds with the parietal cell enzyme  $\text{Na}^+/\text{K}^-$  ATPase preventing the influx of protons ( $\text{H}^+$ ) inside the stomach. Thus reduces the gastric juice.

**Indication**

Dog/cat/pig: Gastric & duodenal ulcers, Erosive gastritis, Oesophagitis and hypersecretory conditions.

**Dosage**

Dog: 0.5- 1.5mg/ kg BW OD IV

Cat: 0.75- 1mg/ kg BW OD PO

Pig: 40mg/ kg BW PO OD for two days.

**Contraindication**

Do not use in animals which are hypersensitive to proton pump inhibitors.

**Precaution**

Avoid concomitant usage with phenytoin.

Dosage adjustment should be done in animals with liver and renal diseases.

Brand Name	Manufacturer	MAH	Presentation
Ocid IV	Zydus AH	KMT PMS	40mg/ml, 40mg vial
Omeprazole	Zydus AH	Karma PMS	20mg/tab, 10tab/strip

### 7.3. Pantoprazole

**Class**

Proton pump inhibitor

**Action**

At the secretory surface of gastric parietal cells, pantoprazole forms a covalent bond at two sites of the H<sup>+</sup>/K<sup>+</sup> ATPase (proton pump) enzyme system. There it inhibits the transport of hydrogen ions into the stomach. Pantoprazole reduces acid secretion during both basal and stimulated conditions.

**Indication**

Dog/cat/foal: Gastric acid related pathologies/ diseases.

**Dosage**

Dog/cat: 0.7-1mg/ kg BW IV

Foal: 1.5mg/ kg BW IV

### Contraindication

Contraindicated in patients known to be hypersensitive to it or other proton pump inhibitors.

Parental pantoprazole should be strictly administered via Intravenous route. Shouldn't be administered via Intramuscular or subcutaneous route

### Precaution

Very slow Intravenous administration of pantoprazole should be done.

Avoid concomitant use of sucralfate.

Adverse reaction like diarrhea, vomiting etc is seen.

Brand Name	Manufacturer	MAH	Presentation
Zepoxin	Zydus	KMT PMS	40mg/ml, 40mg vial

## 7.4. Ranitidine

### Class

Histamine (H<sub>2</sub>) receptor antagonist

### Action

Prevents histamine induced gastric juice secretion by blocking H<sub>2</sub> receptors.

### Indication

Dog/cat: Gastric and duodenal ulcers, uremic gastritis, stress-related or drug-induced erosive gastritis, esophagitis, duodenal gastric reflux and esophageal reflux.

### Dosage

Dog/cat: 0.5-1mg/kg BW BID

Horse: 6.6 mg/ kg BW q 4hrs

### Precaution

Rapid IV boluses have been associated with vomiting in small animals.

Avoid in pregnant, lactating animal.

Avoid in animal with renal and hepatic diseases.

Brand Name	Manufacturer	MAH	Presentation
Aciloc	Cadilla	Karma PMS	25mg/ml, 2ml ampoule

## 7.5. Silica in Dimethicone

### Class

Surfactant and antifatulent, anti-bloat

### Action

They have antifoaming and water repellent property. They exert defoaming action by preventing formation of mucous surrounded gas pockets in GI tract.

### Indication

Cattle/buffalo/sheep/goat: Bloat, tympany.

**Dosage:** *(As indicated by the manufacturer)*

Brand Name	Manufacturer	MAH	Presentation
Blotosil	Vetoquinol	Karma PMS	Each 100ml contains Simethicone 1000mg, 100ml Bottle.

## 8. INTRAUTERINE PREPARATIONS

### 8.1. Nitrofurazone+Urea+Metronidazole

#### Action

Nitrofurazone is antibacterial, active against gram +ve and Gram -ve organisms. It is also potential anti-protozoal agent.

Urea is proteolytic and dissolves quickly in uterine fluid and penetrates mucosal folds of uterus. It enhances the action of nitrofurazone in combination by acting as carrier. It removes necrotic debris, liberates ammonia making the uterine medium alkaline and thus checking the microbial growth. (For action of metronidazole refer metronidazole under the heading antimicrobials)

#### Indication

Cattle/sheep/goat: Metritis, pyometra, vaginitis, retention of fetal membrane.

**Dosage:** *(As indicated by the manufacturer)*

Brand Name	Manufacturer	MAH	Presentation
Nitro- UM	Ukay Remedy Pvt Ltd	KMT PMS	Nitrofurazone 60mg + Urea 500mg +Metronidazole 1000mg Per Bolus.

### 8.2. Trimethoprim+Sulphamethaxazole+Urea

#### Action

Potentiated sulphonamide combination have potent bactericidal effect against Gram +ve and -ve organisms which cause uterine infections (For the action of urea refer Nitrofurazone+Urea+Metronidazole action notes).

#### Indication

Cattle/sheep/goat: Metritis, pyometra, vaginitis, retention of fetal membrane.

**Dosage:** *(As indicated by the manufacturer)*

Brand Name	Manufacturer	MAH	Presentation
Oriprim-U Vet Bolus	Zydus AHL	Karma PMS	Trimethoprim 0.1g + Sulphamethoxazole 0.5g+ Urea 6g Per Bolus.

## 9. MINERALS

### 9.1. Calcium Gluconate

#### Action

Calcium is an essential Element involved in maintenance of numerous hemostatic roles and key reactions including activation of enzymes, cell membrane potentials, nerve and musculoskeletal functions.

#### Indication

Cattle/buffalo/sheep/goat/horse/pig/dog/cat: Hypocalcemia, rickets, osteomalacia, osteoporosis, Lead and fluoride poisoning, tympany, acid indigestion.

#### Dosage

**Dog: Parental:** Calcium gluconate 10% injection: Warm to body temperature and give IV at a rate of 50 – 150mg/kg (0.5 – 1.5 ml/kg) over 20 – 30 minutes. If bradycardia Develops, halt infusion. Long term therapy may be accomplished by increasing dietary calcium and using vitamin D.

**Oral treatment of hypocalcaemia:** 5-22mg of the elemental calcium/kg q8hrs. Adjust the dose by monitoring the serum and calcium level.

**Cat: Parental:** Calcium gluconate 10% injection: Warm to body temperature and give IV at a rate of 95 – 140mg/kg (1 – 1.5 ml/kg) over 20 – 30 minutes.

**Oral Treatment:** 10-25mg of the elemental calcium/ kg q6-8hrs. Adjust the dose by monitoring the serum calcium and phosphorous level.

Cattle/horse/sheep/goat/pig: 150- 250mg/kg IV slow.

#### Contraindication

Contraindicated in animals with ventricular fibrillations and hypercalcemia.

#### Precaution

Rapid IV infusion will lead to hypotension, cardiac arrhythmias and cardiac arrest. Parental administration is strictly IV. IM or SC leakage or administration will lead to tissue reaction.

Brand Name	Manufacturer	MAH	Presentation
Calcium-Sandoz	Novartis	Karma PMS	Calcium Gluconate 50mg + Calcium Lactobionate 87.5 mg per ml, 10ml ampoules

## 9.2. Cobalt+Copper+Manganese+Ferrous+Zinc

### Indication

Regulation of estrous cycle, improve breeding efficiency, repeat breeding, habitual abortion.

### Dosage, Contraindication and Precaution

*(Refer product inserts)*

Brand Name	Manufacturer	MAH	Presentation
Cyclomin-7	Zoetis India Ltd	Karma PMS	Cu 0.700g+Co 0.056g+I2 0.14g+Fe 1.4g+Mn 0.56g+Se 0.004g+Zn 0.28g/bolus

## 9.3. Inorganic Phosphorous

### Indication

Rickets, osteomalacia & pica, post parturient paresis, post parturient haemoglobinuria, milk fever associated with hypophosphatemia, paraplegia, delayed puberty, anoestrus, silent heat, repeat breeding, abortion.

### Dosage, Contraindication and Precaution

*(Refer product inserts)*

Brand Name	Manufacturer	MAH	Presentation
Inorganic Phosphorus Inj	NA	NA	79.4mg Sodium acid phosphate, 40% W/V, 10ml vial

## 9.4. Butaphosphan + Cyanocobalamin

### Indication

Low productivity, ketosis, infertility, puerperal diseases, hepatic dysfunction, supportive therapy.

### Dosage, Contraindication and Precaution

*(Refer product inserts)*

Brand Name	Manufacturer	MAH	Presentation
Metstrom	Zydus AH	Karma PMS	Butophosphan 100mg + Cynocobalamin 50 mcg/ml, 30ml vial.

## 9.5. Iron Dextran

### Action

Iron is necessary for myoglobin and hemoglobin in the transport and utilization of oxygen. Ionized iron is a component in the enzymes cytochrome oxidase, succinic dehydrogenase and xanthine oxidase.

### Indication

Iron dextran is used in the treatment and prophylaxis of iron deficiency anemia primarily.

### Dosage

Pig: For prevention of iron deficiency anemia in piglets

1 – 3 days of age: 100 – 150 mg of elemental iron IM

> 3days of age: 100-200 mg of elemental iron IM

Dog: For iron deficiency anemia: Iron dextran 10 – 20 mg/kg once IM, followed by oral therapy.

Cat: Chronic renal failure: 50mg/cat IM every 3-4 wks in conjunction with erythropoietin.

### Contraindication

Contraindicated in anemia other than iron deficiency anemia, severe infection, inflammation, UTI and in animals with hepatic, renal and cardiac diseases. Cats mostly show intolerance to oral iron. High parental doses of iron are embryotoxic and teratogenic.

### Precaution

Avoid concurrent use of chloramphenicol and antacid and advice the owner to avoid egg and milk as they decrease its bio availability.

Brand Name	Manufacturer	MAH	Presentation
Imferon	Shreya	Karma PMS	Iron dextran 50mg/ml, 2ml ampoule



## 9.6. Yeast extract+Ferrous sulphate+Copper sulphate+Vit B+Lactic acid

### Indication

Anorexia, microbial imbalance, simple indigestion, ruminal acidosis, ruminal stasis.

### Dosage, Contraindication and Precaution

*(Refer product inserts)*

Brand Name	Manufacturer	MAH	Presentation
Rumen Eco Bolus	Provet Pharma Pvt Limited	Karma PMS	Each bolus contains Lactobacillus sporogenes 2 million CFU, Lactobacillus boulardii 1 million CFU, Lactobacillus acidophilus 1.5 million CFU, Live Yeast culture 3g, Ginger powder 100mg, Liver extract 5mg, DL Methionine 100mg, L-Lysine 170mg, Amylase 1500 FCCU, Cellulose 3500 CMCU, Xylanase 2000FCCU, Papain 1500 FCCU

## 9.7. Mineral Supplement

### Indication

Mineral deficiency disorders like impaired digestion and assimilation, retarded growth and muscular dysfunction.

For faster growth, improved fertility, higher productivity.

### Dosage, Contraindication and Precaution

*(Refer product inserts)*

Brand Name	Manufacturer	MAH	Presentation
Mintroplex	Provet Pharma Pvt Ltd	Karma PMS	Per kg of mineral mixture contains Vit A 2000,000 IU, Vit D3 11600 IU, Vit E 800 IU, Vit B2 1200IU, Vit B12 1600mcg, Vit B6 240 mg, Vit K 160mg, Folic acid 40mg, Niacinamide 5.28 g, Calcium pantothenate 1760 mg, Choline chloride 600mg, L- methionine 8g, L-lysine 4g L- Tryptophan. 1kg packet.
Feedvet-M	Shelter Pharma Ltd	KMT PMS	Per kg of mineral mixture contains Vit b2 800mcg, Vit B2 2200,000 IU, Vit A 1000mg, Vit E 4000 mg, Vit K 1000 mg, Vit D 3 420,000 IU, Nicotinamide 500mg, Cal- Panthothenate, Choline chloride 80,000mg, Calcium 3,00,000mg, Phosphorous 3,00,000mg, Iodine 500mg, Iodine 4000mg, Iron 10,000 mg, Manganese 200mg, Cobalt 2000mg, Copper 650mg, Zinc 28mg, Selenium 28mg, L-methionine 2500mg, L-Lysine 6500mg, Dextrose 10%. 1kg jar.

## 10. VITAMINS

### 10.1. B-complex with liver extract

#### Indication

Non specific anorexia, convalescence, liver disorders, debility and general weakness, parasitic anemia and gastro intestinal disorder.

#### Dosage, Contraindication and Precaution

*(Refer product inserts)*

Brand Name	Manufacturer	MAH	Presentation
Belamyl	Zydus AH	Karma PMS	Thiamine 10mg+Riboflavin 3mg+Niacinamide 100mg+vitamin B12 10mcg per ml, 10ml vial

### 10.2. Vitamin A

#### Class

Vitamins

#### Action

It is nutritional fat soluble hormone that regulates gene expression.

#### Indication

Hypovitaminosis A, infertility, night blindness, xerophthalmia, keratomalacia, dermatological diseases, supportive therapy in UTI, RTI and GI infections.

#### Dosage

Dog: Hypovitaminosis:

- ❖ 10,000-100,000 IU/dog IM q 3 days. Not more than two doses should be given.
- ❖ 10,000IU/dog PO q24hrs for 3 days.

Dermatological conditions: 10,000 IU/dog PO q 24hrs for 3 days.

Cat: Hypovitaminosis - 10,000 IU/cat q24hrs PO for 3 days.

For other animals - Refer the product inserts.

#### Contraindication

Contraindicated in pregnant animals.

### Precaution

Use gloves while handling topical preparation of Vit A as it is teratogenic. Avoid eye, mouth and mucous membrane contact. Avoid direct exposure of the drug to direct sunlight. Avoid concurrent use of topical & parental preparation of vitamin A. Prolong use or over dosage will lead to kerato conjunctivitis, bone pain, joint pain and dermatitis.

Brand Name	Manufacturer	MAH	Presentation
Vitamin A concentrate Inj	Vetindia Pharmaceuticals	Vetline PMS	Vitamin A 600,000 IU in 2 ml, 2ml ampoule

### 10.3. Vitamin B-complex (IV Injectable)

#### Class

Vitamins

#### Action

They are cofactors to the enzymes for intermediary metabolism and biosynthesis.

#### Indication

Vitamin B deficiency particularly in the patient with renal and hepatic diseases, anorexia.

**Dosage:** *(As indicated by the manufacturer)*

#### Precaution

All Vitamin B are photo sensitive, keep away from direct sunlight. Anaphylaxis may be seen when given via IV route.

Brand Name	Manufacturer	MAH	Presentation
Beejet	Vetsfarma Ltd	KMT PMS	Thiamine 33.3mg+Riboflavin 33.3mg+Niacinamide 33.3mg+Cynacobalamin 33.3mg per ml, 30ml vial.

### 10.4. Vitamin K

#### Class

Vitamins

## Action

Involved in the formation of active coagulation factor II, VII, IX and X by the liver.

## Indication

Toxicity due to coumarin and its derivatives, hypovitaminosis K.

## Dosage

Dog/Cat:

- ❖ First generation coumarin poisoning or Vit K deficiency: Initially 2.5mg/kg BW SC at several sites followed by 1-2.5mg/kg BW PO q 8-12hrs for 5-7 days.
- ❖ Second generation coumarin (brodifacoum) poisoning: Initially 5mg/kg BW SC at several sites followed by 2.5mg/kg BW PO q 12hrs for 3 weeks. Re-evaluate the coagulation status of the animal for 3 weeks after the treatment.
- ❖ Liver disease (after biopsy): 0.5-1 mg/kg BW q 12hrs, re-evaluate after 2 days.

## Precaution

Avoid concurrent use of aspirin, allupurinol, chloramphenicol, cemitidine, metronidazole, ketoconazole.

Brand Name	Manufacturer	MAH	Presentation
Menadione Sodium Bisulphite Inj	Vulcan Laboratories Pvt Ltd	Medicocity (Direct)	Menadione sodium bisulphate 10mg/ml, 1ml ampoule

## 10.5. Vitamins - AB2D3K

### Class

Vitamins

**Indication:** Stimulate milk production and fat content of the milk, to prevent muscular dystrophy, to improve fertility, to maintain growth and milk production during scarcity of feed, curled toe paralysis and rickets.

### Dosage, Contraindication and Precaution

*(Refer product inserts)*

Brand Name	Manufacturer	MAH	Presentation
Vitamin AB2D3K	Shelter Pharma	KGT PMS	Vit A -82500 IU, D3 - 12000IU, B2- 52mg, K- 10mg, 1 kg pkt

## 10.6. Vitamin B12

### Class

Vitamins

### Action

It is important cofactor for enzymes responsible for DNA & RNA synthesis and carbohydrate synthesis.

### Indication

Vitamin B12 deficiency.

### Dosage

Dog: 0.25-1mg/ dog SC, IM q 7days for 4 weeks.

Cat: 0.125- 0.25/ cat SC, IM q 7days for 4-6 weeks.

### Contraindication

Do not give through IV route.

### Precaution

Hypersensitivity to the phenol preservative can occur.

Brand Name	Manufacturer	MAH	Presentation
Vit-B12 Injection	Zydus Animal Health	Medicocity (Direct)	Cyanocobalamin 100mcg/ml, 100ml bottle

## 10.7. Vitamin B6+Methylcobalamin

### Class

Vitamins

### Action

Vitamin B12 blocks antigen induced histamine release, inhibits phosphodiesterase and protease release. Methyl cobalamine protects against

neurotoxicity by enhancing brain cell methylation, modulates lymphocyte function by augmenting regulatory T cell activities and nerve cell regeneration.

**Indication**

Chronic fatigue syndrome, muscular dystrophy and neurological ageing. It is also used along with oxytetracycline/ tetracycline and doxycyclines in treatment of immune immediate dermatosis such as lupos onychondystrophy, discoid lupos erythematous and Phephigus foliaceus.

**Dosage, Contraindication and Precaution**

*(Refer product inserts)*

Brand Name	Manufacturer	MAH	Presentation
Neuroxin-M	Zydus Animal Health	Karma PMS	Methylcobalamin 500mcg + Vit B6 50mg + Nicotinamide 50mg per ml, 10ml vial

# 11. INFUSION FLUIDS

## 11.1. Calcium, Magnesium, Phosphorous & Dextrose

### Class

Parenteral fluids

### Indication

Milk fever, hypomagnesaemia (grass tetany), hypophosphatemia or hypoglycaemia (ketosis), post-parturient hemoglobinuria and neuromuscular disorders

### Dosage

Cattle, Buffalo, Horse: 200 to 500 ml IV SC

Pig: 50-100 ml IV SC

Sheep, Goat: 50-125 ml IV SC

Dog: 10-30ml

Cat: 5-15 ml

### Precaution

Before intravenous injection, the solution should be warmed to body temperature and must be administered slowly to avoid possible coronary depression (heart block).

As with any hypertonic solution, pain and swelling may be seen following administration; massage the injection sites to spread the solution for quicker absorption and to reduce the risk of tissue reaction.

Avoid solution contamination and discard unused portion within 24 hours.

Brand Name	Manufacturer	MAH	Presentation
Milk Fever Formula	Zoetis	KMT PMS	Ca borogluconate 25 %, Mg hypophosphite 5%, and dextrose monohydrate 10%, 450 ml

## 11.2. Dextrose

### Class

Parenteral fluids (5% Dextrose)



**Indication**

Dextrose infusion is indicated in bovine ketosis, hypoglycemia, weakness, cachexia and in conditions in which oral feeding is impossible. Amount and rate of infusion depends on the severity of the condition.

**Dosage**

Amount and rate of infusion depends on the severity of the condition. The following are the recommended maintenance fluid rates.

Large animal: 50ml/kg/day

Small animal: 60 ml/kg/day (Dog: 2-6mg/kg/hr; Cat: 2-3mg/kg/hr)

*(Note: In case of increased fluid loss due to various conditions, the maintenance rate should be increased by 15-20ml/kg/day for necessary replacement of lost fluid)*

**Precaution**

Before IV injection the solution should be warmed to body temperature.

Do not use if solution is not clear.

Dextrose containing infusion must be used with care in diabetic patients.

In general, it is preferable to add 2.5 to 5% glucose to a non-alkalinizing fluid type (RL) and administer a slightly hypertonic solution than to administer isotonic dextrose by itself.

Brand Name	Manufacturer	MAH	Presentation
5D	Claris Lifesciences Limited	Karma PMS	Each 100 ml contains Anhydrous Dextrose 5g, 500ml

**11.3. Dextrose Sodium Chloride****Class**

Parenteral fluids (DNS)

**Indication**

Indicated in hypoglycemia complicated with dehydration/fluid loss due to infectious diseases, trauma, surgery, burns, debility etc. in which oral supplementation is impossible

**Dosage**

Amount and rate of infusion depends on the severity of the condition. The

following are the recommended maintenance fluid rates.

Large animal: 50ml/kg/day

Small animal: 60 ml/kg/day (Dog: 2-6mg/kg/hr; Cat: 2-3mg/kg/hr)

*(Note: in case of increased fluid loss due to various conditions, the maintenance rate should be increased by 15-20ml/kg/day for necessary replacement of lost fluid)*

### **Precaution**

Before IV injection the solution should be warmed to body temperature.

Do not use if solution is not clear.

Dextrose containing infusion must be used with care in diabetic patients.

Brand Name	Manufacturer	MAH	Presentation
DNS	Claris Lifesciences Limited	Karma PMS	Each 100 ml contains Sodium chloride-0.9g, Anhydrous Glucose-0.5g, 500ml

## **11.4. Sodium Chloride**

### **Class**

Parenteral fluids (Normal Saline)

### **Indication**

Indicated to restore circulatory volume; replacement of fluid and electrolyte in dehydration, shock, fluid loss due to vomiting, diarrhea, hemorrhage.

### **Dosage**

Amount and rate of infusion depends on the severity of the condition. The following are the recommended maintenance fluid rates.

Large animal: 50ml/kg/day

Small animal: 60 ml/kg/day (Dog: 2-6mg/kg/hr; Cat: 2-3mg/kg/hr)

*(Note: In case of increased fluid loss due to various conditions, the maintenance rate should be increased by 15-20ml/kg/day for necessary replacement of lost fluid)*

### **Contraindication**

Before IV injection the solution should be warmed to body temperature.

Do not use if solution is not clear.

Brand Name	Manufacturer	MAH	Presentation
NS	Claris Lifesciences Limited	Karma PMS	Each 100 ml contains NaCl 90 mg, 500ml

### 11.5. Ringers Lactate

#### Class

Parenteral fluids (RL electrolyte)

#### Indication

As an alkaliniser agent; replacement of fluid and electrolyte in Calf scour, diarrhea, vomiting, dehydration, debility, bovine ketosis, hepatitis, poisoning, hemorrhage.

#### Dosage

Amount and rate of infusion depends on the severity of the condition. The following are the recommended maintenance fluid rates.

Large animal: 50ml/kg/day

Small animal: 60 ml/kg/day (Dog: 2-6mg/kg/hr; Cat: 2-3mg/kg/hr)

*(Note: In case of increased fluid loss due to various conditions, the maintenance rate should be increased by 15-20ml/kg/day for necessary replacement of lost fluid)*

#### Contraindication

Before IV injection the solution should be warmed to body temperature.

Do not use if solution is not clear.

Brand Name	Manufacturer	MAH	Presentation
RL	Claris Lifesciences Limited	Karma PMS	Each 100 ml contains Dextrose 29 g, NaCl 0.6 g, Kcl 0.04 g, CaCl 0.027 g, Na lactate 0.312 g, 500ml

### 11.6. Sodium bicarbonate

#### Class

Alkalizing agent

**Action**

It is an alkalizing agent that is used to increase the PH level of blood by directly increasing the bicarbonate content in the plasma

**Indication**

Metabolic acidosis, barbiturate toxicity, in severe diarrhea which is often accompanied by significant loss of the bicarbonate

**Dosage**

Cattle, Horse, Pig, Dog, Cat: 2.2 ml per kg BW administered IV, slowly with caution or diluted in adequate quantity of intravenous fluid therapy solutions, e.g. Sodium Chloride Injection (0.9%), 5% Dextrose Injection. It can also be given by SC route.

**Contraindication**

Known hypersensitivity to the drug. Avoid use in metabolic or respiratory alkalosis. It is contraindicated in animals losing chloride by vomiting and animals receiving diuretics.

**Precaution**

Over dosage and alkalosis should be avoided. Caution to be exercised in the use in animals with congestive heart failure or other edematous or sodium-retaining states, as well as in animals with oliguria or anuria.

The addition of sodium bicarbonate to parenteral solutions containing calcium should be avoided, except where compatibility has been previously established. Precipitation or haze may result from sodium bicarbonate - calcium mixtures.

Brand Name	Manufacturer	MAH	Presentation
Sodib	Jayson Pharmaceuticals Limited	Karma PMS	75 mg/ml, 25ml vial
Sodac	Neon Laboratories Limited	KMT PMS	8.4 w/v, 25 ml vial

## 12. EXTERNAL OINTMENTS

### 12.1. Gamma Benzene Hexachloride

#### Class

Organochloride compound

#### Action

Organochlorides act as contact poisons. They cause CNS stimulations by excess release of acetylcholine at the end of nerve axon leading to spastic paralysis of parasites.

#### Indication

Maggot infestation, follicular mange

#### Dosage (*As manufacturer's directives in the product insert*)

#### Precaution

Avoid licking of the compound as it is highly toxic

Brand Name	Manufacturer	MAH	Presentation
Lorexane cream	Virbac Animal Health India Pvt. Ltd.	Karma PMS	Gamma benzene hexachloride 0.1%, proflavine hemisulfate 0.1 %, and cetrимide 0.45% , 100g tube
Lorexane Spray	Virbac Animal Health India Pvt. Ltd.	Karma PMS	0.1% Gamma benzene Hexachloride IP, proflavin hemisulphate 0.1% and Cetrимide solution BP 0.45% and contains natural fly repellent oils, 50 ml spray

### 12.2. Gentamicin Ointment

#### Class

Aminoglycoside antibacterial

#### Indication

Indicated in treatment of bacterial infection of surgical or traumatic origin,

superficial wounds, burns, ulcers

**Dosage** (*As per manufacturer's directives in product insert*)

Brand Name	Manufacturer	MAH	Presentation
Glentacin	Ethicare laboratories	Medicocity (Direct)	0.1% w/w, 100 g tube

### 12.3. Nitrofurazone

#### **Class**

Antimicrobials (Nitrofurazone group)

#### **Indication**

Indicated in treatment of bacterial infection of surgical or traumatic origin, superficial wounds, burns, ulcers; It is active in presence of blood, serum and pus

**Dosage** (*As per manufacturer's directives in product insert*)

#### **Contraindication**

Known hypersensitivity to the drug

Brand Name	Manufacturer	MAH	Presentation
Nitrofurazone	Arora Pharma	Paras PMS	0.2 % w/w, 500g jar

### 12.4. Herbal Topical Preparations

#### **Class**

Ayurvedic (Herbal)

#### **Indication**

Indicated in treatment of bacterial and fungal infection of surgical or traumatic origin, superficial wounds, external inflammatory conditions, pruritis, maggot wound, mange

**Dosage** (*As per manufacturer's directives in product insert*)

Brand Name	Manufacturer	MAH	Presentation
Maggotocidal spray	Zydus AH	Karma PMS	Extract Tailapatra (Eucalyptus globules) - 60mg, Nimba (Azadiracta indica) 50mg, Bhutrina (Andropogon citrastus) -40mg, Devadaru (Cedrus deodara) - 28mg, Haridra (Curcuma longa) - 2mg
Zymagout	Zydus AH	Karma PMS	Neem oil 7.2%, Camphor oil 6%, Karanj oil 5.10%, Turpentine oil 41.43%, Turmeric oil 0.15%, 100 ml spray

## 13. EYE/EAR OINTMENTS/DROPS

### 13.1. Chloramphenicol

**Class**

Broad spectrum antibacterial

**Indication**

Conjunctivitis, keratitis, corneal ulcer, blepharitis, hordeolum, trachoma, otitis

**Dosage**

Apply topically on the conjunctival sac/eye QID. Continue treatment for 48 hours after the eye appears normal.

**Contraindication**

Known hypersensitivity to the drug.

Do not apply to animals producing milk for human consumption.

Use a separate tube for different animal to prevent transmission of infection.

Brand Name	Manufacturer	MAH	Presentation
Chloramphenicol eye ointment	Soft Medicaps Ltd.	Karma PMS	Each applicap contains 1% w/w Chloramphenicol, 100 capsules/jar

### 13.2. Gentamicin

**Class**

Aminoglycoside antibacterial

**Indication**

Conjunctivitis, Keratitis, Corneal ulcer, Blepharitis, Hordeolum, Trachoma, Otitis

**Dosage**

Apply 2-3 drops on unaffected & affected eye daily & affected ear TID/QID



Brand Name	Manufacturer	MAH	Presentation
Gentocin	Unison Drugs Pvt Ltd	Medicocity (Direct)	Gentamicin sulphate 0.3%, 5 ml vial

### 13.3. Ciprofloxacin

#### Class

Fluroquinolone

#### Indication

Conjunctivitis, keratitis, corneal ulcer, blepharitis, hordeolum, trachoma, otitis

#### Dosage

Apply 2-3 drops on unaffected & affected eye daily & affected ear TID/QID

Brand Name	Manufacturer	MAH	Presentation
Cirpofloxacin Eye/Ear Drops	Zydus	Karma PMS	Ciprofloxacin 0.3%, 5 ml vial

**14.1. Analgin**

**Class**

Imidopyrin analgesic

**Action**

Analgin have a potent analgesic, anti inflammatory and antipyretic action

**Indication**

Pain, fever, rheumatoid conditions, spastic conditions, colic and other inflammation conditions

**Dosage**

Cattle: 10-20 g IV, IM  
 Horse: 10-30 g IV, IM  
 Calf, Foal: 2.5-7.5 g IV, IM  
 Pig: 5-15 g IV, IM  
 Sheep, Goat: 1-4 g IV, IM  
 Dogs, Cat: 0.5-2.5 g IV, IM

**Precaution**

Hypersensitivity reactions may occur

Brand Name	Manufacturer	MAH	Presentation
Analgin	KAPL	KMT PMS	500 mg/ml, 30 ml vial

**14.2. Analgin Pitofenone hydrochloride, fempiverinium bromide**

**Indication**

Inflammation of musculoskeletal system, Lameness, painful conditions, non-specific pyrexia.

**Dosage**

Cattle: 10-20 g IM  
 Horse: 10-30 g IM  
 Calf, Foal: 2.5-7.5 g IM  
 Pig: 5-15 g IV, IM  
 Sheep, Goat: 1-4 g IM  
 Dogs, Cat: 0.5-2.5 g IM

## Precaution

Given through Intramuscular route only

Brand Name	Manufacturer	MAH	Presentation
Ridalpin	KAPL	KMT PMS	Each ml contains 500 mg of Analgin, 2mg Pitofenone hydrochloride, 0.02mg of Fempiverinium bromide, 30 ml vial

## 14.3. Ketoprofen

### Class

NSAID (Propionic acid derivative)

### Action

It has analgesic, antipyretic and anti inflammatory effect. It acts by inhibition of Prostaglandins and Leukotrienes. It purportedly has inhibitory activity on lipoxygenase.

### Indication

Symptomatic relief of pain, pyrexia and inflammation of musculo skeletal origin

### Dosage

Cattle, buffaloes, pigs, sheep and goats: 3 mg per kg BW OD for up to 3 days, IV, IM

Horses: 2.2mg/kg BW OD for up to 5 days, IV, IM

Dogs: 2mg/kg BW OD for up to 3 days IV, IM

### Contraindication

Known hypersensitivity to the drug.

In Horses, gastric mucosal damage & GI ulceration, renal crest necrosis, & mild hepatitis may occur.

In dogs, vomiting, anorexia, & GI ulcers may occur.

### Precaution

At high concentrations it may cause irritation, GI ulceration or bleeding, hypoproteinemia, significant renal or hepatic impairment; may mask the signs of infection (inflammation, hyperpyrexia)

Do not use in later trimester of pregnancy

Avoid SC injections

Concomitant administration with corticosteroids may significantly increase the risk for GI adverse effects and that with aminoglycosides may have increased risk of nephrotoxicity.

Brand Name	Manufacturer	MAH	Presentation
Neoprofen	Zoetis	Karma PMS	100 mg/ml, 15 ml

#### 14.4. Ibuprofen

##### **Class**

NSAID (Propionic acid derivative)

##### **Action**

It has analgesic, antipyretic and anti inflammatory effect. It acts by inhibition of Cyclo oxygenase in the Prostaglandin synthesis pathway. It prevents formation of Thromboxane A<sub>2</sub> by platelets.

##### **Indication**

Symptomatic relief of pain, pyrexia and inflammation of musculoskeletal origin

##### **Dosage**

Dog: 10 mg/kg BW at 24-48 hours interval PO

##### **Contraindication**

Not recommended in cats

##### **Precaution**

At high concentrations it may cause irritation, bleeding or ulceration of gastric mucosa

Brand Name	Manufacturer	MAH	Presentation
Ibugesic-400	Cipla	Karma PMS	400mg tablet; pack size of 10 tablets/strip
Ibulab-400	Laborate Pharmaceutical India Limited	Karma PMS	400mg tablet; pack size of 10 tablets/strip

## 14.5. Meloxicam

### **Class**

Oxycam NSAID

### **Action**

Inhibits prostaglandin synthesis by more selectively inhibiting the cyclooxygenase (cox-2) and phospholipase A<sub>2</sub> enzymes, thereby exerting potent anti inflammatory, anti exudative, analgesic and antipyretic effects

### **Indication**

It is principally used for the symptomatic treatment of osteoarthritis in dogs. It is also indicated in inflammatory conditions associated with pneumonia, pleuritis, mastitis, prolapse of uterus, laminitis, myositis, arthritis, surgical interventions, otitis, and premature labor.

### **Dosage**

#### **In Pneumonia and Prolapse**

Cow, Horse, Pig, Sheep, Goat, Dog: 0.5mg/kg BW q24h for 3 days, IV, IM, SC

#### **In other conditions**

Cow, Horse, Pig, Sheep, Goat, Dog: 0.2-0.3mg/kg BW IV, IM, SC  
Oral dosage for Dogs: 0.2mg/kg on first day and 0.1mg/kg once daily on subsequent days

### **Contraindication**

Not to be used in individual animals with known hypersensitivity to the drug. GI effects (vomiting, anorexia, diarrhea, melena, ulceration), elevated liver enzymes, pruritis, azotemia, elevated creatinine, and renal failures are the reported adverse effects of this drug.

### **Precaution**

Use with caution in patients with GI disorders, impaired hepatic, cardiac or renal functions or hemorrhagic disorders.

Use with extreme caution in dehydrated, hypovolemic, or hypotensive animals as there is a potential increased risk of renal toxicity developing.

In cats, single SC dose @ 0.3 mg/kg BW has been reported to be relatively safe but repeated use of it had been associated with renal failure and death.

Use cautiously as most NSAIDs are excreted in milk.

Brand Name	Manufacturer	MAH	Presentation
Oxycamvet	Vetindia	Vetline PMS	5 mg/ml, 30 ml vial
Melox-B	Brilliant Bio Pharma Limited	KGT PMS	5 mg/ml, 30 ml vial

## 14.6. Paracetamol (Acetaminophen)

### Class

Para-amino phenol derivative

### Action

Acetaminophen produces potent analgesic and antipyretic action as it inhibits prostaglandin synthesis via a weak, reversible, isoform non-specific inhibition of cyclooxygenase

### Indication

It is indicated in Pyrexia of unknown origin, rheumatic conditions, pain, colic. It is occasionally used as an oral analgesic in dogs.

### Dosage

Cattle, Horse, Sheep, Goat: 10 mg/kg BW IM

### Contraindication

It is contraindicated in cats. At suggested dosages in dogs, there is some potential for renal, hepatic, GI and hematologic effects occurring.

### Precaution

Over dosage may lead to renal and hepatic toxicity. It is generally not recommended to use acetaminophen in dogs during the immediate post operative phase (first 24 hours) due to an increased risk of hepatotoxicity. Acetylcysteine is the antidote for acetaminophen over dosage.

Brand Name	Manufacturer	MAH	Presentation
Melosafe Plus	Safecon Lifesciences	KMT PMS	Each ml contains Paracetamol 150mg & Mefenamic acid 50mg, 30 ml vial

## 14.7. Meloxicam & Paracetamol

### Indication

Pyrexia of unknown origin, rheumatic conditions, pain, colic

### Dosage

As antipyretic: 30 ml/300 kg BW

As analgesic:

Oral dosage in animals: 2 Bolus/400 kg BW, OD

Cattle, Buffalo, Pig: 18 ml/300 kg BW IM

Calf, Sheep, Goat: 1 ml/10 kg BW IM

Horse: 30 ml/250 kg BW IM

Brand Name	Manufacturer	MAH	Presentation
Proxyvet-MP	Vetoquinol/ Ruby Biopharma Pvt. Ltd.	Karma PMS	Each ml contains 5mg of Meloxicam and Paracetamol 150 mg, 30 ml vial
Proxyvet-MP	Vetoquinol/Ruby Biopharma Pvt. Ltd.	Paras PMS	Each boli contains Meloxicam 100 mg, Paracetamol 1500 mg, pack size 10 x 2's

## 14.8. Phenylbutazone

### Class

Pyrazolone derivative NSAID

### Action

It has analgesic, anti-inflammatory, antipyretic, and mild uricosuric properties as it inhibits cyclooxygenase and hence reduces prostaglandin synthesis.

### Indication

It has been used primarily for the treatment of lameness in horses and, occasionally, as an antipyretic, as an analgesic and anti-inflammatory in symptomatic treatment of inflammatory and painful conditions of muscle, bones and joints in dogs, cattle, and swine.

**Dosage**

Dog: 22 mg/kg BW, IV

Cattle: 10 mg/kg BW initially followed 24 hours later by 5 mg/kg BW q48h, IV

Horse: 2.2-4.4 mg/kg BW OD, IV

Pig: 4 mg/kg BW OD, IV

Sheep, Goat: 5 mg/kg BW OD, IV

**Contraindication**

Do not use in cats. It is contraindicated in animals with known hypersensitivity to the drug, history of pre-existing hematologic or bone marrow abnormalities, renal disease, GI ulcers, and in food producing animals or lactating dairy cattle and dairy goats.

**Precaution**

Do not administer injectable preparation IM or SC as it is very irritating and may cause necrosis and sloughing. Accidental injection into the carotid artery may result in excitement, prostration and sometimes death. Foals with a heavy parasite burden or that are undernourished may be more susceptible to developing adverse effects.

Brand Name	Manufacturer	MAH	Presentation
Artizone-S	Vetnex	Karma PMS	Each ml contains 200mg phenylbutazone and 20mg sodium salicylate, 30 ml vial
Esgipyrin-N	Zydus AHL	Karma PMS	Each ml contains Phenylbutazone 150mg, Analgin 150mg, Lignocaine 10mg, 5x5ml amp

**14.9. Flunixin meglumine****Class**

NSAID

**Action**

Flunixin is a very potent inhibitor of cyclooxygenase and, like other NSAIDs, it exhibits analgesic, anti-inflammatory, and antipyretic activity.



**Indication**

**Horse:** Inflammation and pain associated with musculoskeletal disorder, visceral pain associated with colic, foal diarrhea, shock, respiratory disease, pre and post ophthalmic and general surgery

**Cattle:** Pyrexia associated with respiratory diseases and endotoxemia, inflammation associated with endotoxemia, acute respiratory disease, acute coliform mastitis with endotoxic shock, pain (downer cow), calf diarrhea

**Pig:** Pyrexia associated with respiratory disease, agalactia/hypogalactia, lameness, piglet diarrhea

**Dog:** Disk problems, arthritis, heat stroke, diarrhea, shock, ophthalmic inflammatory conditions, pre and post ophthalmic and general surgery, parvo virus infection

**Dosage**

**Cattle:** 1.1-2.2 mg/kg BW given slow IV either as a single dose or divided into two doses q12h for up to 3 days

**Horse:** 1.1 mg/kg BW IV or IM OD for up to 5 days

**Pig:** 2.2 mg/kg BW IM once, only in the neck musculature with a maximum of 10 ml per site

**Dog:** 0.5-2.2 mg/kg BW IM or IV, may be repeated in q12h/q24h if necessary

**Contraindication**

History of hypersensitivity reactions to the drug

**Precaution**

To be used cautiously in animals with preexisting GI ulcers, renal, hepatic, or hematologic disorders.

The IM route is extra-label in cattle and should only be used when the IV route is not feasible for use.

In dog, consider using other NSAIDs first.

Brand Name	Manufacturer	MAH	Presentation
Flunimeg	Zydus AH	Karma PMS	Flunixin meglumine 50mg/ml, 10 ml vial

## 15. ANTIHISTAMINES

### 15.1. Chlorpheniramine maleate

#### Class

H<sub>1</sub> blocker (Alkylamine derivative)

#### Action

Antihistamines competitively inhibit action of histamine at H<sub>1</sub> receptor sites. It also has anticholinergic and sedative effects.

#### Indication

Allergic disorders like eczema, urticaria, skin edema, photo dermatitis, dermatitis, rhinitis, pregnancy toxemia, RFM, mastitis, burns, anaphylactic shock and reactions, insect bites, stomatitis, serum sickness, laminitis, rumen atony in cattle

#### Dosage

Cattle: 30-50 mg (total dose) IM

Dog: 0.2 -0.4 mg/kg BW BID PO, IM

Cat: 2 mg/Cat BID PO, IM

#### Contraindication

Contraindicated in pregnant animals as it has teratogenic effects

#### Precaution

Sedation, CNS excitement, Gastrointestinal disturbances are most commonly seen side effects. The sedative effects of antihistamines may adversely affect the performance of working dogs. It should be used with caution in angle closure glaucoma, hyperthyroidism, cardiovascular disease, prostatic hypertrophy, bladder neck obstruction, and COPD if mucosal secretions are a problem. Its dose shouldn't exceed 0.5 mg/kg BW in dogs.

Brand Name	Manufacturer	MAH	Presentation
Cadistin Injection	Zydus AH	Karma PMS	10 mg/ml, 30 ml vial
Chlorpheniramine Maleate Tab	High Tech Pharma	Paras PMS	Each tab contains 4mg chlorpheniramine maleate, 10 tab/strip

## 16. STEROIDS

### 16.1. Dexamethasone

#### **Class**

Glucocorticoid (Synthetic analogue)

#### **Action**

It enhances carbohydrate and protein metabolism, increases haemoglobin, red cells and also have potent anti-inflammatory and immunosuppressive effect. Glucocorticoids have effects on virtually every cell type and system in mammals.

#### **Indication**

Indicated in treatment of acute inflammatory conditions, endocrine conditions, rheumatic diseases (rheumatoid arthritis), allergic states, hypersensitivity reactions (Asthma), shock, toxemia, tissue damage, dermatologic diseases, haematologic disorders, neoplasia, nervous system disorders, GI diseases renal diseases, ophthalmic inflammatory conditions and stress, Induction of parturition

#### **Dosage**

Cattle, Horse: 0.1 mg/kg BW; 10 to 30mg IV, IM (total dose)

Calf, Sheep, Goat, Pig: 2 to 5 mg IV, IM

Dog: 0.5-2 mg IV, IM

Cat: 0.25-0.5mg IV, IM

Induction of parturition in large animals: 40 mg IV

#### **Contraindication**

Systemic use of glucocorticoids is generally contraindicated in systemic fungal infections, when administered IM in animals with idiopathic thrombocytopenia and those hypersensitive to it. Avoid use in pregnancy.

#### **Precaution**

Do not administer the propylene glycol base injectable product rapidly intravenously as hypotension, collapse, and hemolytic anemia can occur. Gradual withdrawal is advised after prolonged treatment of animals. It should not be used in the presence of infection without antibiotic cover.

It should be used with care in congestive heart disease, renal insufficiency, diabetes mellitus, and degenerative eye disease.

Administration during the later stages of pregnancy in cattle and sheep may induce early abortion.

Corticosteroids lower the immune response to infections, and may delay wound healing and fracture repair, particularly in older animal.

Prolonged glucocorticoid therapy may suppress adrenocortical activity.

Patients receiving corticosteroids at immunosuppressive dosages should generally not receive live attenuated virus vaccines.

Brand Name	Manufacturer	MAH	Presentation
Dexona	Zydus AH	KMT PMS	Each ml contains 4mg Dexamethasone Sodium Phosphate, 5 ml vial

## 16.2. Isoflupredone acetate

### Class

Glucocorticoid (fluorinated synthetic corticosteroid)

### Action

It enhances carbohydrate and protein metabolism, increases haemoglobin, red cells and also have potent anti-inflammatory and immunosuppressive effect. Glucocorticoids have effects on virtually every cell type and system in mammals.

### Indication

Indicated in adjunctive treatment of bovine ketosis, alleviating pain and lameness associated with musculoskeletal conditions, acute hypersensitivity reactions, severe toxicity, shock, stress conditions, dystocia, retained placenta, inflammatory ocular conditions, snake bite, parturient paresis, inflammation associated with recurrent airway obstruction in COPD in horses

### Dosage

Cattle: 10- 20 mg (total dose) IM, according to animal size and severity of the condition, may be repeated after 12 -24 hours

Horse: 5–20 mg IM, Intraarticular, intrasynovial

Pig: 5 mg/136 kg BW IM. Adjust dose proportionately based on the body size.

### **Contraindication**

Systemic use of glucocorticoids is generally contraindicated in systemic fungal infections, when administered IM in animals with idiopathic thrombocytopenia and those hypersensitive to it. Avoid use in pregnancy.

### **Precaution**

Gradual withdrawal is advised after prolonged treatment of animals. Corticosteroids lower the immune response to infections, and may delay wound healing and fracture repair, particularly in older animal. Prolonged glucocorticoid therapy may suppress adrenocortical activity. It should not be used in the presence of infection without antibiotic cover. It should be used with care in congestive heart disease, renal insufficiency, diabetes mellitus, GI ulcers and degenerative eye disease. Chronic use in young, growing animals must be undertaken cautiously, as decreased growth may occur.

Brand Name	Manufacturer	MAH	Presentation
Isoflud	Zydus AH	Karma PMS	Isoflupredone acetate 2 mg/ml, 10 ml vial

## **16.3. Prednisolone**

### **Class**

Glucocorticoid

### **Action**

Prednisolone has typical metabolic effects of natural corticosteroids. It modifies immune responses and has anti inflammatory effects. Its synthetic analogues have very well anti inflammatory effects.

### **Indication**

Indicated in treatment of acute inflammatory conditions, endocrine conditions, rheumatic diseases (rheumatoid arthritis), allergic states, hypersensitivity reactions (Asthma), shock, toxemia, tissue damage, dermatologic diseases, haematologic disorders, neoplasia, nervous system disorders, GI diseases renal diseases, ophthalmic inflammatory conditions and stress, hydrocephalus in dogs and persistent haematuria in cats

**Dosage**

Cattle, Horse: 0.5 mg/kg BW IM (10 to 20 ml Total dose)

Calf, Pig: 2 to 5 ml IM (Total dose)

Dog, Cat: 1 to 3 ml IM (Total dose)

Dog: 0.5 mg/kg BW BID PO for 5-10 days

Cat-2.5-5mg PO every 24-48 hrs

**Contraindication**

Systemic use of glucocorticoids is generally contraindicated in systemic fungal infections, when administered IM in animals with idiopathic thrombocytopenia and those hypersensitive to it. Avoid use in pregnancy.

**Precaution**

Gradual withdrawal is advised after prolonged treatment of animals.

Corticosteroids lower the immune response to infections, and may delay wound healing and fracture repair, particularly in older animal.

Prolonged glucocorticoid therapy may suppress adrenocortical activity.

It should not be used in the presence of infection without antibiotic cover.

It should be used with care in congestive heart disease, renal insufficiency, diabetes mellitus, GI ulcers and degenerative eye disease.

Chronic use in young, growing animals must be undertaken cautiously, as decreased growth may occur.

Brand Name	Manufacturer	MAH	Presentation
Prednisolone Acetate	Vetoquinol	Karma PMS	Prednisolone 10 mg/ml, 10 ml vial
Prednisolone Tab	NA	NA	Prednisolone 5 mg tab, 10 tab/strip

**16.4. Triamcinolone Acetonide****Class**

Glucocorticoid (Synthetic)

**Action**

Triamcinolone has potent anti inflammatory action. It also modifies body immune responses. On systemic use, it may cause suppression of pituitary adrenal-axis, which may lead to corticosteroid deficiency.

## Indication

Indicated in treatment of acute inflammatory conditions, endocrine conditions, rheumatic diseases (rheumatoid arthritis), allergic states, hypersensitivity reactions (Asthma), shock, toxemia, tissue damage, dermatologic diseases, haematologic disorders, neoplasia, nervous system disorders, GI diseases renal diseases, ophthalmic inflammatory conditions and stress, bovine ketosis

## Dosage

Cattle, Horse, Dog: 12 -20 mg IM SC PO (Total dose)  
6-18 mg IA, Intra Synovially (Total dose)

Dog: 0.05 mg/kg BW BID/TID

## Contraindication

Systemic use of glucocorticoids is generally contraindicated in systemic fungal infections, when administered IM in animals with idiopathic thrombocytopenia and those hypersensitive to it. Avoid use in pregnancy.

## Precaution

Gradual withdrawal is advised after prolonged treatment of animals.

Corticosteroids lower the immune response to infections, and may delay wound healing and fracture repair, particularly in older animal.

Prolonged glucocorticoid therapy may suppress adrenocortical activity.

It should not be used in the presence of infection without antibiotic cover.

It should be used with care in congestive heart disease, renal insufficiency, diabetes mellitus, GI ulcers and degenerative eye disease.

Chronic use in young, growing animals must be undertaken cautiously, as decreased growth may occur.

Brand Name	Manufacturer	MAH	Presentation
Vetalog	Zydus AH	Karma PMS	Triamcinolone acetonide 6 mg/ml, 5 ml vial

## 17. HORMONES

### 17.1. Buserelin acetate

#### **Class**

GnRH analogue

#### **Action**

It stimulates follicular development, oestrus and ovulation by enhancing simultaneous release of FSH and LH from pituitary gland.

#### **Indication**

Indicated in reduced fertility as a result of anoestrus silent heat, anovulation/delayed ovulation and follicular cyst; induction of ovulation and improvement of conception rate

#### **Dosage**

(For 0.0042 mg/ml injection)

##### **i. Anovulation/delayed ovulation**

Cattle: 2.5 ml IM, IV

(It should be administered at the time of insemination, or 6 - 8 hours before insemination. Ovulation usually follows within 24 hours.)

##### **ii. True anoestrus**

Cattle: 5 ml IM, IV

Horse: 5 ml IM, IV

Sheep, Goat: 1 ml IM, IV

(Oestrus should occur within 8 - 22 days after treatment. If no heat is observed or there are no palpable follicle on the ovary after this date then the dose may be repeated. If however a corpus luteum is palpated, then prostaglandin F<sub>2</sub> $\alpha$  or one of its analogues should be administered, thus allowing the animal to return to heat 2- 3 days later.)

##### **iii. Improvement of conception rate after AI, synchronization of heat**

Cattle: 2 ml IM, IV

(Buserelin acetate should be administered at the time of insemination or service, or up to 6 - 8 hours before. Ovulation is induced within 24 hours of treatment. Pregnancy rate in cows may also be improved by giving a single injection on day 12 after insemination by helping to prevent luteolysis and



consequent embryo mortality.)

**iv. Follicular cyst with or without symptoms of nymphomania**

Cattle: 5 ml IM, IV

Horse: 10 ml IM, IV

(A CL will usually be clearly detectable on either the affected or normal ovary within 8 days after injection. The response to treatment should be checked after 10 - 14 days. If no CL is present, or if newly formed cysts are detected, treatment should be repeated. The animal usually comes into heat after 20 days of treatment.)

**v. Prophylaxis of fertility disorders by induction of oestrus cycle**

Cattle: 5 ml IM

(Buserelin acetate administered prophylactically after 10-14 days post partum induces ovarian function (ovulation) and accelerates uterine involution.)

**vi. Anovulation associated with prolonged oestrus and a well developed follicle**

Cattle: 10 ml IM

(It should be given on the first day when the follicle has reached its maximum size, this being determined by previous clinical history and rectal examinations. The injection is given best 6 hours prior to service. The mare should be served again the next morning if she is still in oestrus. If ovulation does not occur within 24 hours of treatment, then the injection should be repeated.)

**vii. Improvement of conception rate**

Cattle: 10 ml IM

(The injection is given at service or optimally 6 hours before.)

**viii. Anoestrus**

Cattle: 5 ml IM

(Injection is administered twice at an interval of 24 hours. If no oestrus occurs within 10 days, repeat on the 11<sup>th</sup> and 12<sup>th</sup> after the first treatment.)

**ix. Cystic ovarian changes with or without prolonged or permanent oestrus**

Cattle: 10 ml IM

(One treatment is usually sufficient but may be repeated if there is no evidence of response (e.g. regression of cysts or remission of the prolonged or permanent oestrus) within 10-14 days of first injection.

### **Contraindication**

Contraindicated in swine

### **Precaution**

Do not slaughter the animals for human consumption for 10 days following the injection.

Brand Name	Manufacturer	MAH	Presentation
Receptal	Intervet	Karma PMS	0.0042 mg/ml
Ovunsafe	Safecon Lifesciences	Paras PMS	0.004 mg/ml, 10 ml vial

## **17.2. Oestradiol Benzoate**

### **Class**

Natural steroidal oestrogens

### **Action**

Natural steroidal oestrogen has low oral activity and so simple ester of steroidal oestrogen is used in the therapeutics as it releases parent molecule on hydrolysis.

### **Indication**

Misalliance (post coitus), urinary incontinence in old/spayed bitches, uterine infections, anal adenoma and to induce oestrus in bitches

In cattle, to induce oestrus, parturition, for pyometra and retention of fetal membranes

### **Dosage**

Dog: 1-3 mg PO OD/0.5-1 mg IM

Cattle: *Refer product insert*

### **Precaution**

Polydypsia, polyuria, GI upsets, and suppression of red cell production are some of the side effects. Chronic use may lead to hypogonadism and cystic

ovary in females.

Brand Name	Manufacturer	MAH	Presentation
CIDIROL (Oestradiol Benzoate)	NA	NA	0.5 mg, 10 mg tab

### 17.3. CIDR-B intravaginal Progesterone

#### Class

Progesterone

#### Action

It stimulates luteal action and cause quieting of myometrium, enhances endometrial glandular secretions, thus favor in maintenance of pregnancy. At lower doses, it induces ovulation by its indirect effects on LH release.

#### Indication

Silent heat, anoestrus control, synchronization of oestrus cycle, cystic ovaries

#### Dosage

Synchronization and treatment of Anoestrus:

#### ***Programme A: CIDR-B + Oestradiol capsule***

Day 0 Insert CIDR-B + Oestradiol capsule

Day 12 Remove CIDR-B

Day 14-15 Inseminate on observed heat

#### ***Programme B: CIDR-B + oestradiol injection***

Day 0 insert CIDR-B

Day 7 removal of CIDR-B

Injection of 1 mg Oestradiol 24 to 48 hrs after removal of Insert. Most animals will come to heat over the next 2-5 days after injection

Brand Name	Manufacturer	MAH	Presentation
TRIU-B	Virbac	Karma PMS	Each insert contains 1.38 gm of progesterone

## 17.4. Hydroxyprogesterone Caproate

### Class

Progesterone

### Action

It stimulates luteal action and cause quieting of myometrium, enhances endometrial glandular secretions, thus favor in maintenance of pregnancy. At lower doses, it induces ovulation by its indirect effects on LH release.

### Indication

Threatened abortion, habitual abortion, repeat breeding caused due to failure of implantation (nidation) of zygote in uterus associated with progesterone deficiency, Induction of estrus, Prolapse of uterus due to higher level of estrogen, supportive therapy in Cystic Ovarian Disease

### Dosage

Habitual abortion in early pregnancy

Cattle, Buffalo: 500 mg IM after 1<sup>1/2</sup> month of pregnancy. To be repeated at every 10days interval for 4-5 times.

Habitual abortions in mid or late pregnancy: 500 mg IM for 3 days. To be repeated every week for 3 weeks

Induction of oestrus in post partum anoestrus condition: 500 mg IM. To be repeated after 10 days if female does not come in heat or oestrus.

Repeat breeders with weak corpus luteum: 250 mg IM after insemination followed at weekly interval for 3 weeks

Prolapse of uterus due to pronounced heat: 500 mg IM. To be repeated on the 3<sup>rd</sup> day if necessary.

Habitual pronounced estrus: 500 mg IM to be given at the beginning of oestrus.

Post-partum prolapse of uterus: 500 mg IM on alternate days for three times followed by weekly for three weeks.

Antepartum prolapse of uterus: 500 mg IM every two days for three times.

Cystic Ovarian Disease: 500 mg IM

### Precaution

Prolonged exogenous progesterone administrations may cause uterine glandular hyperplasia, accumulation of fluids in uterus and may lead to endometritis

Brand Name	Manufacturer	MAH	Presentation
P-Depot	Zydus AH	Karma PMS	Hydroxyprogesterone 250 mg/ml, 2 ml ampoule

## 17.5. Medroxyprogesterone Acetate

### Class

Progestin (Synthetic)

### Action

Progestins are primarily produced endogenously by the corpus luteum. They transform proliferative endometrium to secretory endometrium, enhance myometrium hypertrophy and inhibit spontaneous uterine contraction. Medroxyprogesterone has exhibited a pronounced adrenocorticoid effect and can suppress ACTH and cortisol release. It is anti estrogen and will also decrease plasma testosterone levels in dogs.

### Indication

It is indicated primarily to treat sexually dimorphic behavior problems such as roaming, inter-male aggressive behaviors, spraying, mounting, etc.; feline psychogenic dermatitis and alopecia, postpone or suppress oestrus, mammary tumours and habitual abortions

### Dosage

To Postpone or suppress oestrus in Dogs: <25 kg BW-5 mg OD, PO, IM  
>25 kg BW-10 mg OD, PO, IM

At anoestral stage: 50 mg SC and repeat every 6 months

Cat: 2.5 mg OD PO, IM

To prevent abortion in Cats: 1-2 mg once weekly and stop 7-10 days before parturition.

To treat behavioral disorders Dog: 10 mg/kg SC, IM; 3 times yearly

Cat: 5-20mg/kg SC, IM; 3 times yearly

### Contraindication

Do not use in pre-pubescent cats or dogs, diabetics, pregnancy, pseudo pregnant bitches, females in diestrus or with prolonged heat, uterine hemorrhage or discharge. Adverse effects include increased appetite and or thirst, depression, lethargy, personality changes, adrenocortical depression, mammary changes, diabetes, pyometra

## Precaution

Cystic endometrial hypoplasia may occur.

SC injection may cause permanent local alopecia, atrophy and depigmentation may occur. If injecting SC, it is recommended to use the inguinal area to avoid these manifestations.

Because of serious adverse effects profile, it is recommended to consider safer alternatives first.

Brand Name	Manufacturer	MAH	Presentation
Depo-Provera	Max Life Sciences	KMT PMS	150 mg/ml, 1 ml amp
Deviry	Elder Pharma	Karma PMS	10 mg tab, 10 tab/strip

## 17.6. Oxytocin

### Class

Nano peptide Hormone

### Action

Oxytocin has specific action on uterine smooth muscles and myoepithelial cells of mammary glands. It binds to specific receptors present in mammary gland and myometrium and thereby stimulates smooth muscle contractions promoting uterine motility and milk letting down.

### Indication

Induction or enhancement of uterine contractions at parturition (only in case of sufficient cervical dilatation), postpartum retained placenta and metritis, uterine involution after caesarian section or after manual correction of prolapsed uterus,agalactia

### Dosage

IV, IM, SC		
Animal	Obstetrics	Milk let down
Cow, Mare	75 - 100 IU	10 - 20 IU
Ewe	30 - 50 IU	2 - 10 IU
Sow	30 - 50 IU	5 - 20 IU
Bitch	5 - 25 IU	2 - 10 IU
Queen	5 - 10 IU	1 - 10 IU

### **Contraindication**

Known hypersensitivity, cervical obstruction or closed cervix, in dystocia prior to correction of abnormal presentation, severe pre-eclamptic toxemia, predisposition to uterine rupture (high parity and previous caesarian section), foetal distress, protracted labor

### **Precaution**

Intravenous administration may be done by diluting Oxytocin with water for injection in 1:10 ratio. Treat hypoglycemia or hypocalcemia if present before using oxytocin. When used prepartum, oxytocin should be used only when the cervix is relaxed naturally or by the prior administration of estrogens. Not effective for longer than 48 hours post partum as uterine sensitivity is reduced.

Brand Name	Manufacturer	MAH	Presentation
Evatocin	Neon Laboratories Limited	KMT PMS	5 IU/ml, 1 ml amp

## **17.7. PG 600**

### **Class**

Non-pituitary Gonadotropin

### **Action**

PG 600 is a combination of Pregnant Mare Serum Gonadotropin (PMSG) and Human Chorionic Gonadotropin (HCG). PMSG mimics the effects of Follicle-Stimulating Hormone (FSH) inducing follicular growth in inactive ovaries of mature animals. HCG mimics the effects of pituitary Luteinizing Hormone (LH) causing ovulation and promotes the formation and maintenance of corpus luteum. Hence, the combination of these two hormones induces fertile estrus.

### **Indication**

Indicated for induction of fertile oestrus in healthy prepubertal gilts and sows

### **Dosage**

Prepubertal Gilts, Sows post weaning: 5 ml SC at the base of the ear  
(Note: Prepubertal gilts should be injected when they are selected for addition to the breeding herd. Sows should be injected at weaning during periods of delayed return to oestrus)

## Precaution

Treatment will not induce estrus in gilts that have already reached puberty. In case of any anaphylactic reaction give adrenaline 1-3 ml of 1: 10,000 solutions IM.

Brand Name	Manufacturer	MAH	Presentation
PG600	NA	NA	Each 5 ml contains Serum Gonadotrophin 400 IU and Chorionic Gonadotrophin 200 IU, 5 ml vial

## 17.8. Prostaglandin

### Class

Prostaglandin F<sub>2</sub> alpha (Natural)

### Action

Prostaglandin stimulates myometrial contractions and also produces luteolytic effects. The luteolytic effects indirectly favor myometrial activity as it removes luteal source of progesterone block. It also enhances cervical dilatation with selective spasmogenic action.

### Indication

For synchronization of heat, embryo transfer, for therapy of cystic corpus luteum, chronic metritis, pyometra, & for induction of parturition & abortion

### Dosage

**Cattle, Buffalo:** For synchronization of heat: 25 mg. Two injections 11 days apart between 5th and 18th day of oestrus cycle

For induction of heat: 25 mg between 5<sup>th</sup> and 18<sup>th</sup> day and a second dose may be administered in non responders after 11 days.

For treatment of chronic metritis, pyometra, induction of abortion after 2nd month of pregnancy, and cystic corpus luteum: 25 mg

**Sheep:** For synchronization of heat: 5 to 20 mg. Non responders may be again treated on the 6th day.

Induction of lambing: 20 mg after 140<sup>th</sup> day of pregnancy

**Mares:** To induce heat: 3 to 5 mg.

**Pigs:** Induction of farrowing after 113<sup>th</sup> day of pregnancy: 25 mg IM or 5 to 10 mg IM on two days & labor starts approximately 27 hours from last treatment.



**Dog:** For abortion: 20 mcg/kg from day 33 - 53 of gestation every 8 hours or 30 mcg/kg every 12 hours for 72 hours (total dose 180 mcg/kg) results in abortion within 56 - 80 hours after the treatment begins, the bitches should be hospitalized and food withheld 24 hours before starting the treatment.

In pseudopregnancy: 0.5 mg/kg

**Cats:** For abortion: 0.5 mg/kg during 3rd trimester of pregnancy results in abortion after 24 hours of treatment.

### **Contraindication**

Do not use in pregnant animals unless indication is for abortion. Non steroid anti-inflammatory agents like indomethacin should not be used simultaneously. It must not be administered IV.

### **Precaution**

Pregnant woman and persons with asthma or other respiratory disease must not handle the drug. Milk from treated animals is not suitable for human consumption for 7 days following injection.

Brand Name	Manufacturer	MAH	Presentation
Lutalyse	Zoetis	Karma PMS	Natural PG 5mg/ml, 5ml vial

## **17.9. Cloprostenol Sodium**

### **Class**

Prostaglandin F<sub>2</sub> alpha analogue

### **Action**

Prostaglandin stimulates myometrial contractions and also produces luteolytic effects. The luteolytic effects indirectly favor myometrial activity as it removes luteal source of progesterone block. It also enhances cervical dilatation with selective spasmogenic action.

### **Indication**

Anoestrus, suboestrus, luteal cyst, synchronized breeding, removal of mummified fetus, chronic endometritis, pyometra, and induction of parturition

### **Dosage**

Cattle, Buffalo: 2 ml IM, SC; 1.3 ml IV

## Contraindication

Contraindicated in pregnancy except for termination of pregnancy

## Precaution

Keep away from pregnant women, person suffering with asthma or other diseases of respiratory tract.

Brand Name	Manufacturer	MAH	Presentation
Clostenol	Zydus AH	Karma PMS	Synthetic PG 250 mcg/ml, 2ml amp
Estrumate	MSD	Paras PMS	Synthetic PG 250 mcg/ml, 20 ml vial

## 17.10. FSH (Porcine pituitary derived FSH)

### Class

Follicle Stimulating Hormone

### Action

In normal oestrus cycle, generally only one follicle becomes dominant, fully develops, and is ovulated, and other smaller follicles regress during each follicular wave. The administration of exogenous FSH at the time of the emergence of ovarian follicles allows for additional follicles to develop and ovulate and thus resulting in superovulation.

### Indication

For the induction of superovulation in beef and dairy heifers and cows

### Dosage

Cattle: 2.5 ml (87.5 IU) IM BID for 4 consecutive days. In conjunction with the 6th dose, administer prostaglandin (cloprostenol sodium or dinoprost tromethamine) to cause luteolysis and induce estrus.

### Precaution

In event of self injection, seek medical attention immediately

Brand Name	Manufacturer	MAH	Presentation
Follitropin	NA	NA	FSH 20 mg/ml, 20 ml vial

## 18. LOCAL ANAESTHETICS

### 18.1. Lignocaine HCl

#### Class

Local anesthetic

#### Action

It stabilizes the neuronal membrane and prevents initiation and transmission of nerve impulses, thereby effecting local anesthetic action. It is also considered as a class 1 (membrane stabilizing) anti-arrhythmic agent. The duration of the action potential is decreased due to blockade of the sodium channel and the refractory period is shortened.

#### Indication

Local/regional Infiltration anesthesia, nerve block, epidural anesthesia, regional anesthesia to facilitate clinical/surgical procedures, arrhythmia associated with general anesthesia and digitalis induced arrhythmia

#### Dosage (For Lignocaine HCL 2% Injection)

Epidural: Cattle, Horses: 5-15 ml

Dog, Cat: 1 ml per 22 kg BW

Nerve Block: Cattle, Horses: 5-20 ml

Infiltration: Dilute to 0.5% concentration (1 ml of 2% solution diluted with 3 ml of sterile water = 4ml of a 0.5% solution)

#### Contraindication

Known history of hypersensitivity to the drug or other amide type of local anesthetics, not to be used as intravenous injection during infiltration and in conjunction with adrenaline should not be used in arrhythmia

#### Precaution

To be used with care in animals with myasthenia gravis, severe shock, or impaired cardiac conduction. Local anesthetic techniques must not be used when there is inflammation and/or sepsis in the region of the proposed injection and in the presence of septicemia.

Brand Name	Manufacturer	MAH	Presentation
Lox 2%	Neon Laboratories Limited	KMT PMS	21.3 mg/ml, 2% solution, 30 ml vial

## 19. SEDATIVES & TRANQUILIZERS

### 19.1. Ketamine

#### **Class**

Tranquilizer/Dissociative anesthetic

#### **Action**

Ketamine inhibits GABA and induce both anesthesia and amnesia by functionally disrupting the CNS through over stimulating the CNS or inducing a cataleptic state.

#### **Indication**

For sedation, tranquilization, and as general anesthetic agent for minor surgical procedures that do not require skeletal muscles relaxation in cats. Ketamine may be used in conjunction with xylazine in dogs, cats, horse and donkey.

#### **Dosage**

Dog: 5-10 mg/kg BW IM, IV, SC

Cat: 11-33 mg/kg BW IM, IV, SC

Goat: 22-44 mg/kg BW IM, SC

Pig: 15-20 mg/kg BW IM, SC

Horse: 2.2 mg/kg BW IM, IV, SC

#### **Ketamine & Xylazine combination**

**Cat:** xylazine at 1.1mg/kg BW and atropine at 0.3mg/kg BW IM may be used 20mins prior to ketamine at 22mg/kg BW.

**Horse, Donkey:** Xylazine is administered by slow IV at 1.1mg/kg BW. The horse should appear sedated by 2mins post injection and then ketamine at 2.2mg/kg BW IV is administered (don't delay ketamine injection longer than 5 mins after xylazine administration). Anesthesia will last for 10-30mins.

**Dog:** xylazine at 1mg/kg BW IM, immediately follow by ketamine at 15mg/kg BW IM. Anesthesia will last for about 25mins.

**Swine:** 10-15mg/kg BW IM with xylazine at 0.5-1mg/kg IM.

#### **Contraindication**

Contraindicated prior hypersensitivity reactions, in head injuries and status epilepticus. It is contraindicated when used alone for major surgery as it does not provide good muscle relaxation.

### Precaution

Use in animals with significant hypertension, heart failure, arterial aneurysms, hepatic or renal insufficiency, seizure disorders may be hazardous.

Minimize exposure to handling or loud noises during the recovery period.

Brand Name	Manufacturer	MAH	Presentation
Pentyl	ACI Limited	KMT PMS	50 mg/ml, 10 ml vial
Verket	Verve Human Care Laboratories	KMT PMS	50 mg/ml, 5x10 ml ampoules

## 19.2. Triflupromazine HCL

### Class

Phenothiazine derivative

### Action

Triflupromazine is a neuroleptic agent having property of antagonism at entral dopamine D<sub>2</sub> receptors effecting sedation. Prominent anti emetic activity is noted.

### Indication

Pre-anesthetic medication, restraint for clinical or diagnostic procedures, minor surgical procedures, in prolapse of uterus/vagina, excitement, vomiting

### Dosage

Horse, Cattle, Buffalo: 0.22-0.33 mg/kg BW IM

Cattle, Buffalo: 0.11-0.18 mg/kg BW IV

Sheep: 0.1 mg/kg BW IV

Pig: 1-2mg/kg BW IM; 0.8 mg/kg BW IV

Dog: 2-4mg/kg BW PO, IM; 1-2mg/kg BW IV

Cat: 2.2-4.4mg/kg BW IM

### Maximum Dose

Horse, Cattle, Buffalo: 100 mg IM

Sheep: 40 mg IV

## Contraindication

Administration along with Epinephrine is contraindicated

## Precaution

It potentiates the effects of other CNS depressants.

Brand Name	Manufacturer	MAH	Presentation
Siquil	Zydus AH	KMT PMS	20mg/ml, 5ml vial

## 19.3. Xylazine HCL

### Class

Sedative/Pre-anesthetic

### Action

Xylazine activates Alpha 2 adrenoceptors (Alpha 2 sympathomimetic action) with potent anti nociceptive/analgesic action so that superficially arising pain is suppressed. It also has analgesic muscle relaxant action.

### Indication

Sedation of a wide variety of domestic, wild or exotic species, analgesia, muscle relaxation and immobilization of excited animals

### Dosage

Horse: 0.5-1.1 mg/kg W IV; 1-2 mg/kg BW IM

Cattle: 0.03-0.1 mg/kg BW IV; 0.1-0.2 mg/kg BW IM

Goat: 0.01-0.5mg/kg BW IV; 0.05-0.5 mg/kg BW IM

Dog, Cat: 0.5-1 mg/kg BW IV; 1-2mg/kg BW IM

Birds: 1-4 mg/kg BW IM

### Contraindication

Contraindicated in conditions in dogs and cats where emesis is undesirable such as obstruction of esophagus, torsion of stomach, hernia; later stages of pregnancy.

Avoid use in animals receiving epinephrine or having active ventricular arrhythmias, shock, severe respiratory depression.

### Precaution

False sense of security may result in injury to the personnel as the animal

reacts to any stimulus.

Xylazine may cause ruminal atony, bloat, and regurgitation with aspiration, excess salivation and polyuria.

Take normal precaution in managing any unconscious or semi conscious ruminants to prevent inhalation pneumonia and bloat.

Don't leave the animals under the influence of xylazine in the sun.

In ruminants lower dose should be used if sedation without recumbency is desired.

### **Antidote**

Yohimbine hydrochloride, 4-aminopyridine

Brand Name	Manufacturer	MAH	Presentation
Xylaxin	Indian Immunologicals Ltd.	Karma PMS	Xylaxine 20 mg/ml, 30 ml vial

## **19.4. Isoflurane**

### **Class**

General anesthetic (Inhalant anesthetic)

### **Action**

Although the precise mechanism that inhalant anesthetics exert is not precisely known, they may interfere with functioning of nerve cells in the brain by acting at the lipid matrix of the membrane. Isoflurane leads to CNS depression, depression of body temperature regulating centers, increased cerebral blood flow, respiratory depression, hypotension, vasodilatation, myocardial depression and muscular relaxation.

### **Indication**

General anesthesia for clinical examination and surgical procedures (It has some distinct advantages over either halothane or methoxyflurane due to lessened myocardial depressant and catecholamine sensitizing effects, and ability to use it safely in animals with either hepatic or renal disease)

### **Dosage**

Dog, Cat: Induction: 5% inhalation

Maintenance: 1.5-2.5% inhalation

*(Note: Concentrations are dependent upon fresh gas flow rate; the lower the flow rate, the higher the concentration required)*

### **Contraindication**

It is contraindicated in patients with a history or predilection towards malignant hyperthermia.

Hypotension, respiratory depression and GI affects are some of the reported adverse effects which are dose dependent.

### **Precaution**

Use with caution in animals with increased CSF or head injury, or myasthenia gravis.

Cautiously use aminoglycosides with halogenated anesthetic agents as additive neuromuscular blockade may occur.

Brand Name	Manufacturer	MAH	Presentation
Isoflurane	NA	NA	100ml Type III amber glass bottle



## 20. INTRAMAMMARY INFUSIONS

### 20.1. Ampicillin & Cloxacillin

**Class**

Antibacterial (Penicillin)

**Indication**

Mastitis in lactating cattle and buffaloes (early treatment) caused by penicillin resistant *Staphylococci*, *E. coli*, *Streptococci* and other sensitive organisms

**Dosage**

*As per manufacturer's directives in the product insert*

**Contraindication**

Known hypersensitivity to the drug

**Precaution**

Always wear gloves when administering the preparation. Persons sensitive to penicillin must be careful to avoid contact with the product. Milk from treated cows should be discarded until all the color residues have disappeared.

Brand Name	Manufacturer	MAH	Presentation
Vetclox plus	Zydus AH	Karma PMS	Each tube contains cloxacillin sodium 200mg and ampicillin 75mg, 10 ml tube

### 20.2. Cefoperazone sodium

**Class**

Third generation Cephalosporin

**Indication**

Treatment of clinical mastitis

**Dosage:** *As per manufacturer's directives in the product insert*

### **Contraindication**

Known hypersensitivity to the drug

### **Precaution**

It is not compatible with aminoglycosides

Brand Name	Manufacturer	MAH	Presentation
Mastiwok	Vetoquinol	Karma PMS	Each tube contains 250 mg Cefoperazone sodium, 10 ml tube

## **20.3. Cefuroxime sodium**

### **Class**

Third generation Cephalosporins

### **Indication**

Mastitis

### **Dosage**

*As per manufacturer's directives in the product insert*

### **Precaution**

Avoid use in penicillin hypersensitive animals as cross resistance between penicillins and cephalosporins has been observed.

Brand Name	Manufacturer	MAH	Presentation
Uddercef	Zydus AH	Karma PMS	Each tube contains 250 mg Cefuroxime sodium, 3.5 gm tube

## **20.4. Strepto-penicillin-SH**

### **Class**

Combination of procaine penicillin and streptomycin (aminoglycoside)

### **Indication**

Acute and chronic mastitis due to susceptible organisms, non-specific mastitis in dairy cows

**Dosage**

*As per manufacturer's directives in the product insert*

**Precaution**

Always wear gloves when administering the preparation. Persons sensitive to penicillin or streptomycin must be careful to avoid contact with the product. Milk from treated cows should be discarded until all the color residues have disappeared.

Brand Name	Manufacturer	MAH	Presentation
Pendistrin-SH	Zydus AHL	Karma PMS	Each tube contains procaine penicillin 100,000IU, streptomycin sulphate 100mg, sulphamerazine 500mg, hydrocortisone acetate 29mg, 6 ml tube

## 21. ANTISEPTICS & DISINFECTANTS

### 21.1. Cetrimide & chlorhexidine

#### Class

Disinfectant/Antiseptic

#### Indication

For general antiseptic purpose, to disinfect wounds, hospital equipment, animal stalls, milking sheds, poultry houses, & farm equipment at strength of 1 in 200 dilutions.

#### Dosage

For general antiseptic purposes to disinfect wards, hospital equipment, animal stalls, milking sheds, poultry houses and farm equipment at 1 in 200 dilutions.

For preliminary cleaning of wounds, burns, and abscesses & rinsing of hands at 1 in 100 dilutions.

For pre-operative preparation of skin and scrub up of surgeon's hands at 1 in 30 dilutions.

For washing udder of cows & buffalo and milkers hands prior to and after milking, & sterilizing diary utensils at 1 in 150 dilutions.

As shampoo for dogs at 1 in 5 dilutions.

#### Contraindication

Cetrimide is cationic disinfectant and thus incompatible with soap

Brand Name	Manufacturer	MAH	Presentation
Saniquad GHS	Sirmaxo Chemicals Pvt Ltd	Karma PMS	Cetrimide 15% and Chlorhexidine gluconate 7.5%, 1 L Bottle

### 21.2. Glutaraldehyde Derivatives

#### Class

Disinfectant/Antiseptic

#### Indication

Disinfection against various bacterial and viral diseases.

**Dosage**

For preventive disinfection, take 500mL in 50 litres of water (1%) and wet surfaces with mob or low pressure sprayers.

For specific disinfection:

- ❖ Bacterial and fungal infection - use 3% dilution in water.
- ❖ Ranikhet Disease – 1% dilution
- ❖ Infectious Bursal Disease – 3 % dilution

Brand Name	Manufacturer	MAH	Presentation
Kohrsolin	Virbac	Karma PMS	100ml contains glutaraldehyde 10gm; 1, 6-dihydroxy 2,5-dioxahexanas 10.3gm, polymethylol urea derivatives 4.6gm, 500ml Jar

**21.3. Povidone iodine****Class**

Disinfectant/Antiseptic

**Indication**

Surface and equipment disinfection, control of mastitis as a “teat dip” after milking, disinfection of skin, as pre and post operative therapy in wounds and burns, ringworm, cut teats and udder wounds, control of dermal and mucosal infections, treatment of metritis and mastitis.

**Dosage**

5% povidone iodine

For topical application use full strength.

For vaginal douche dilute 1 in 4 parts of water.

Brand Name	Manufacturer	MAH	Presentation
Povinzan	Nanz Med Science Pharma Pvt Ltd	Paras PMS	5 % solution, 100ml Bottle

## 22. AYURVEDICS

### 22.1. Antibloat

#### Class

Ayurvedics

#### Indication

Treatment of gaseous and frothy bloat, tympany, colic and impaction

#### Dosage

Given orally or directly into rumen in *Cattle, Buffalo, Horse*: 80 gm  
*Calf, foal, and heifer*: 40 gm, *Pig, sheep, goat*: 20-25 gm

In Gaseous bloat – the dose to be suspended in 250ml of lukewarm water

In Frothy bloat – the dose to be suspended in 250-500ml edible oil

In Impaction: administered with 150-400 gm of Magnesium sulphate.

Brand Name	Manufacturer	MAH	Presentation
Impacdon	Vetsfarma Ltd	KMT PMS	1 kg Packet

### 22.2. Anticough/Expectorant

#### Class

Ayurvedic/Expectorant/Mucolytic

#### Indication

Coughs of all causes

#### Dosage

Orally in cattle and horse @ 30 to 40 g orally once or twice daily

In calf, sheep, colt and pig @ 6 to 12 g orally once or twice daily

Dog and piglet @ 2 to 4 g orally once or twice daily

Brand Name	Manufacturer	MAH	Presentation
Flusafe	Safecon Lifesciences	Paras PMS	1 kg Packet

### 22.3. Anti-Diarrheal

**Class**

Ayurvedic/Antidiarrheal

**Indication**

Acute or chronic diarrhea, dysentery of varying etiology

**Dosage**

Given through oral route in *Buffaloes/Cattle & Horse*: 30 to 50 g orally, once or twice daily

*Calf, Sheep, Colt, Pig*: 6 to 10 g orally, once or twice daily

*Dog & Piglet*: 2 - 3 g orally, once or twice daily and in poultry 0.5 to 1% mixed with the feed.

Brand Name	Manufacturer	MAH	Presentation
Safeherbs	Safecon Lifesciences	Paras PMS	1 kg Packet

### 22.4. Livertonic

**Class**

Ayurvedic/Liver tonic

**Indication**

Anorexia, liver dysfunctions, hepatitis, jaundice, aflatoxicosis, debility and general weakness and during convalescence.

**Dosage**

Used through oral route with Cattle & Horse: 40-50gm twice daily for at least two days

Foal, calf & pig: 20-25 gm twice daily

Sheep & goat: 10-15 gm daily

Brand Name	Manufacturer	MAH	Presentation
Livron	Vetsfarma Ltd	KMT PMS	100 gm Sachet

## 22.5. Rumenotoric/Stomachic

### Class

Ayurvedic/Stomachic

### Indication

Indigestion, Anorexia, ruminal stasis, dyspepsia, constipation, flatulence, general debility & stress condition.

### Dosage

By oral route: in *Cattle, horse, mule*: 40 to 60gm as a bolus or electuary twice daily

*Calf, colt, heifer, adult Pig*: 20 to 30gm as a bolus or electuary twice daily

*Sheep & Goat*: 10 to 15gm as a bolus or electuary twice daily.

Brand Name	Manufacturer	MAH	Presentation
Digestovet	Vetsfarma Ltd	KMT PMS	1 kg Packet

## 22.6. Uterine tonic

### Class

Ayurvedic drug/Uterine tonic

### Indication

Retained placenta, involution of uterus, as an ideal uterine cleansing agent, as supportive treatment to manual removal of placenta. For improved breeding efficiency.

### Dosage

Given orally in *Cows & buffaloes*: 50-60 gm; *Mares*: 30-40 gm; *Sheep/goat*: 8-12 gm.

Administer one double dose orally mixed with molasses or feed soon after calving and repeat single dose after every six hours till the placenta is shed completely in 24 hours.

Brand Name	Manufacturer	MAH	Presentation
Utrosafe	Safecon Lifesciences	Paras PMS	1 kg Packet



## 23. CHEMICAL DRUGS

### 23.1. Alum pure

#### Class

Antiseptic

#### Indication

5% solution as an antiseptic externally on wound in FMD

Used in eye lotion (ZAB) - Composition of ZAB eye lotion - Zinc sulphate:  
Alum: Boric Acid at the ratio of 1:2:3.

Brand Name	Manufacturer	MAH	Presentation
Alum	Arora Pharmaceuticals Pvt. Ltd	KMT PMS	450 gm Packet

### 23.2. Benzoic acid

#### Class

Antifungal agent

#### Action

Benzoic acid is a nitrogen binding agent and has ammonium ion binding activity.

#### Indication

Treatment of dermatomycosis (ringworm infestation) it has both fungistatic and karatolytic activity.

#### Dosage

It is used with salicylic acid for external application as white field ointment (Refer annexure for formulation).

#### Contraindication

Repeated application may cause irritation

Brand Name	Manufacturer	MAH	Presentation
Benzoic acid powder	Arora Pharmaceuticals Pvt. Ltd	Paras PMS	450 gm Packets

### 23.3. Charcoal activated

**Class**

Universal antidote

**Action**

Charcoal activated binds the poison and prevents its absorption from the gastrointestinal tract.

**Indication**

As an absorbent, and universal antidote mixture mainly in poisoning cases.

**Dosage**

Used in universal antidote mixture in the following rate:

- ❖ Activated Charcoal-50g, Magnesium Oxide-25g, Kaolin-25g, Tannic Acid -25g
- ❖ Divide into 5 parts & given in a day by stomach tube in large animals.

**Contraindication**

When taken in higher doses, activated charcoal effectively binds with vitamins, hormones, drugs and other nutrients eliminating them.

Brand Name	Manufacturer	MAH	Presentation
Activated charcoal	Arora Pharmaceuticals Pvt. Ltd	Paras PMS	450 gm Packet

### 23.4. Formaldehyde

**Class**

Preservative

**Action**

Formaldehyde inactivates microorganism by alkylating the amino and sulfhydryl groups of proteins and ring nitrogen atoms of purine base.

**Indication**

Caustic action - Pure formalin may be applied on warts.  
1-2% formalin can be used to sterilize the instruments.

**Dosage**

Antizymotic in cases of bloat in cattle - Used in tympany in cattle at a dose rate of 15ml orally, after mixing with water.

Formalin used to preserve specimens, dead bodies, and is a hardening agent for histological work - 10% formalin is used as preservatives for HP samples and fecal samples.

Antiseptic and footbath in FMD - Used as an antiseptic media and as a foot bath in lesions of the foot as in Foot and Mouth Disease.

**Contraindication**

Toxic and allergic reactions.

Brand Name	Manufacturer	MAH	Presentation
Formaldehyde	Agarwal Pharmaceuticals	KMT PMS	37-40 % 500 ml Bottle

**23.5. Glycerine****Class**

Preservative/Exipient

**Action**

Glycerin is an osmotic dehydrating agent that possesses hygroscopic and lubricating properties.

**Indication**

Indicated in treatment of bovine ketosis and pregnancy toxemia in sheep at dose rate of 350ml to 500ml in cattle and 100 to 150ml in sheep.

50% glycerol saline is used as a preservative for FMD samples.

Used as a lubricant in probes and probangs, tracheal tubes etc.

Also used as an exipient for electuaries, sweetening agent for mixtures, and electuaries and laxative by giving as an enema.

**Dosage**

Horse: 300ml; Dog: 15ml.

Administer with one third volume of water.

## Contraindication

Excessive bowel movement though frequency is not defined.

Brand Name	Manufacturer	MAH	Presentation
Glycerine	Arora Pharmaceuticals Pvt. Ltd	Paras PMS	400 ml Bottle

## 23.6. Hexamine

### Class

Urinary Antiseptic

### Action

Hexamine has an antibacterial activity.

### Indication

Urinary antiseptic in infection of the urinary tract such as nephritis and cystitis.

### Dosage

Composition of urinary antiseptic	
Hexamine	4 - 8g
Sodium Acid Phosphate	30g

Sodium acid phosphate is to be given 4 hours before the administration of hexamine. Hexamine has no action in alkaline urine, so Sodium acid phosphate is added to acidify the urine of Herbivores.

### Contraindication

Hepatic dysfunction, renal parenchymal infection, severe dehydration and metabolic acidosis.

Brand Name	Manufacturer	MAH	Presentation
Hexamine	Arora Pharmaceuticals Pvt. Ltd	Paras PMS	400 gm Packet

## 23.7. Liquid paraffin

### Class

Softeners/Emollients/Laxatives

### Action

Liquid paraffin has a laxative action and it lubricates and softens the stool to facilitate its removal.

### Indication

Externally used on the skin, for its softening & protecting effect, as a lubricant for diagnostic instruments such as probang & stomach tube. Internally as a laxative at the following doses

### Dosage

Dog: 4 - 30ml orally for 3 to 5 days; Pig: 60 - 300ml orally for 3 to 5 days; Horse & cattle: 750ml orally for 3 to 5 days.

### Contraindication

It interferes with absorption of fat soluble vitamins, it gets absorbed into intestinal walls and can cause granulomatous reactions and if it enters lungs, it can cause lipoid pneumonia.

Brand Name	Manufacturer	MAH	Presentation
Liquid paraffin	Arora Pharmaceuticals Pvt. Ltd	Paras PMS	450 ml Bottle

## 23.8. Magnesium Sulphate

### Class

Purgative

### Indication

As an antiseptic at a concentration of 2 - 4%; At saturation as euthanizing agent; As purgative - used in constipation at dose rate of 150 - 200g with water in cattle; As laxative at 0.5 - 1gm/kg body weight; As a general aesthetic agent with chloral hydrate. Magnesium sulphate - 6% and chloral hydrate - 12%, when administered by IV route produces basal narcosis in large animals; Hot saturated solution for hot fomentation in inflammation; A saturated solution of magnesium sulphate may be applied and bandaged over

infected wound.

### **Contraindication**

Hypersensitivity, myocardial damage, hypermagnesemia, hypercalcemia and not to be given in advanced pregnancy since it may cause toxemia.

### **Precaution**

Fetal skeletal demineralization if used for long term and developing fetus may result in neonates with skeletal abnormalities.

Use with extreme caution monitoring heart rate, blood pressure and respiratory rate when used in animals having neuromuscular disorders.

Brand Name	Manufacturer	MAH	Presentation
Magnesium sulphate	Agarwal Pharmaceuticals	KMT PMS	450 gm Packet

## **23.9. Petroleum jelly**

### **Indication**

Used for lubricating thermometer and stomach tube. And also as an ointments for burns. As a base for ointment preparations.

### **Dosage**

Apply on the skin

Brand Name	Manufacturer	MAH	Presentation
WSF	Vishnu Chemicals	KMT PMS	450 gm Jar

## **23.10. Potassium permanganate**

### **Class**

Antiseptic/Disinfectant

### **Action**

It is an oxidizing agent.

### **Indication**

As an antiseptic at 1:1000 - 1:5000 used as wound and mouth lotions; As a

caustic agent - powdered potassium permanganate can be applied as a caustic upon ulcers; As an oxidizing agent - used as an antidote in poisoning with strychnine and all alkaloid poisons; Dilute solution as gastric-lavage. Is used as an aqueous solution to wash out the stomach contents; As a teeth cleansing agent.

**Contraindication**

Irritation of the skin.

**Precaution**

Potassium permanganate may cause allergies.

Brand Name	Manufacturer	MAH	Presentation
Potassium permanganate	Arora Pharmaceuticals	Paras PMS	450 gm Packet

**23.11. Rectified Spirit**

**Class**

Disinfectant & Antiseptic

**Indication**

Used as an antiseptic and in the cleaning of suture wounds, teats etc.

**Contraindication**

Hypersensitivity especially on the skin, causes erythemia, acne form eruptions, urticaria and rashes may be seen in skin.

**Precaution**

Inflammable. Keep the lid tightly closed during storage.

Brand Name	Manufacturer	MAH	Presentation
Rectified spirit	Sirmaxo Chemicals Pvt Ltd	Karma PMS	90 %, 450 ml Bottle

**23.12. Salicylic Acid**

**Class**

Dusting powder

**Action**

It produces its anti-inflammatory effects via suppressing the activity of cyclooxygenase (COX) enzyme that is responsible for production of pro-inflammatory mediators such as prostaglandins.

**Indication**

Used as dusting powder & ointment for wound & as an antifungal agent with benzoic acid.

**Dosage**

Composition of Salicylic Acid Ointment 2%

Salicylic Acid	2g
Paraffin	98g

**Contraindication**

Peripheral vascular disease, skin irritations, anemia and deficiencies.

Brand Name	Manufacturer	MAH	Presentation
Salicyclic acid	Arora Pharmaceuticals	Paras PMS	450 gm Packet

### 23.13. Sodium acid phosphate

**Class**

Ingredient for antiseptic/acidifier.

**Indication**

Used as an ingredient in urinary antiseptics, to make the urine acidic in herbivores species.

**Dosage**

The composition and dosage is given under Hexamine.

Brand Name	Manufacturer	MAH	Presentation
Sodium acid Phosphate	Arora Pharmaceuticals Pvt. Ltd	Paras PMS	450 gm Packet



## 23.14. Sodium bicarbonate

### Class

Antacid

### Action

Attenuation of cellular acidosis and is effective in the exercising muscle

### Indication

Used as a sedative application for minor burns, insect bites and stings. Also as antacid in gastric and intestinal indigestion due to hyperacidity stomachic and anorexia.

### Dosage

1% solution for sedative application for minor burns, insect bites and stings  
Antacid dose - gastric and intestinal indigestion at 2g daily in divided doses in dogs

Stomachic & anorexia in cattle and horses at 15 to 30g orally for 3 to 5 days.

### Contraindication

Higher doses cause nausea, headache and irritability. It also causes severe alkalosis that leads to hypoventilation and decreased serum concentration of ionized calcium.

Brand Name	Manufacturer	MAH	Presentation
Sodium Bicarb	Arora Pharmaceuticals Pvt. Ltd	Paras PMS	450 gm Packet

## 23.15. Sulphanilamide powder

### Class

Antiseptic, antimicrobial dusting powder

### Action

Sulphanilamide competitively inhibits enzymatic reactions involving para-aminobenzoic acid (PABA) needed in enzymatic reactions that produce folic acid, which acts as a co-enzyme in the synthesis of purines and pyrimidines. (Blocks the growth of bacteria)

**Indication**

Used as dressing powder

**Dosage**

Dusting powder sprinkled over the surface of the wounds, cuts etc.

**Precaution**

Not to be given in pregnant animals and animals that is allergic.

Brand Name	Manufacturer	MAH	Presentation
Sulphanilamide	Arora Pharmaceuticals	KMT PMS	450 gm Packet

**23.16. Tincture Benzoin****Class**

Antiseptic and Styptic

**Action**

The active part of benzoin is gum resin.

**Indication**

Used as an antiseptic and styptic (to control external bleeding), Inhalation in Human and Small Animal in case of nasal obstruction, viral respiratory conditions.

**Dosage**

5 ml in 500 ml hot water.

**Contraindication**

Tincture iodine used repeatedly causes contact dermatitis.

Brand Name	Manufacturer	MAH	Presentation
Tincture Benzoin	K. Pharmaceutical Works	Vetline PMS	70-77% alcohol, 450 ml bottle

**23.17. Tincture Iodine****Class**

Antiseptic

**Action**

The actions of iodine is due to presence of di-atomic element form of iodine (free iodine)

**Indication**

Used as an antiseptic

**Dosage**

Apply on the skin

**Precaution**

Use of iodine should be with caution during pregnancies and when used in old or neonates.

Brand Name	Manufacturer	MAH	Presentation
Tincture Iodine	Agarwal Pharmaceutical	KMT PMS	70-77% alcohol, 450 ml bottle

**23.18. Zinc sulfate****Class**

Chemical drug used as footbaths

**Action**

Zinc, a trace element, is necessary for all living organisms. It plays an important role in many cell regulatory processes, including the innate immune response. Stimulation of the innate immune system causes monocyte derived macrophages to proliferate, but also increases macrophage autophagy to facilitate microbial clearance. Increased autophagy is correlated with increased intracellular zinc transport and subsequent metallothionein production. Thus, increasing zinc concentration close to lesions caused by PDD improves conditions for bacterial clearance from these sites. Stimulation of the innate immune response has been shown to be a primary immune response to progressive PDD.

High concentrations of zinc are also toxic to bacteria, because zinc ( $Zn^{++}$ ) is well-known as a sulfhydryl reactive agent and blocks essential reactions in the bacterial cell by binding to sites normally occupied by  $Fe^{++}$  and

Mn<sup>++</sup>. For example, zinc at high concentration is bacteriostatic and at higher levels (10–20 millimolar), it can be weakly bactericidal. *Dichelobacter nodusus* and the *Treponema* spp. also have zinc uptake regulation genes (Znu and Zur genes) that are sensitive to high zinc concentrations. Thus, foot bathing in zinc sulfate can produce a pronounced curative effect against a range of foot rot lesions.

### **Indication**

Conventionally, zinc salts are used to control the growth of moss on structures, walkways, patios and lawns. Zinc oxide also is an industrial preservative, incorporated into carpet fibers to inhibit bacterial and fungal spoilage, and a bacteriostat, applied as a pressure treatment to preserve cut lumber. Other, more significant, non-pesticidal uses of zinc salts include use in fertilizers, animal feed, dry cell batteries, and as galvanizers.

Zinc sulfate is indicated in Papillomatous digital dermatitis (PDD). PDD also referred to as foot rot or infectious pododermatitis is a dermatosis of the digital skin of cattle, sheep and other ungulates and an important cause of lameness. The etiology of this disease is complicated, but appears to include a combined infection of three or four bacterial species: *Treponema* spp., *Fusobacterium* spp., *Bacteroides* spp. and *Dichelobacter nodusus*. PDD occurs on the hairy skin between the hoof and heel of the hind limb characterized by the appearance of red circumscribed plaques. Generally thought to be contagious, foot rot can progress from digital dermatitis to lesions on the interdigital wall of the hoof and subsequent under-running or separation of the hard horn from the foot.

Traditionally, copper sulfate and formalin footbaths have been used for foot rots. However, recently, zinc sulfate has been shown to be effective, safe, practical and economical for use in bovine and ovine footbaths.

### **Dosage**

A 10-20% solution of zinc sulfate (1kg or 2kg ZnSo<sub>4</sub> mixed in 9 litres of water) is used in footbaths as a topical treatment. Bathing time should be a minimum of a slow walk through six metres of foot bath or standing in the solution for 10 minutes, which is better.

If 0.2-2.0% Sodium lauryl sulfate (sodium dodecyl sulfate) is used in combination with zinc sulfate, it acts as a surfactant or excipient and improves the penetration of zinc sulfate into the claw.

In addition to zinc sulfate, copper sulfate and formalin can be used alone or in combination with zinc sulfate for treatment and prevention of PDD.

### **Precaution**

Irritating to eyes and skin.

Very toxic to aquatic organisms and may cause long-term adverse effects in aquatic environment.

Footbaths containing zinc sulfate should be recycled to the farm lagoon, composting system or manure pile and subsequently distributed on farmland in the form of a soil amendment.

Brand Name	Manufacturer	MAH	Presentation
Medizinc Zinc vitriol Zincate Zinco Zincomed Z-Span	Merck	NA	ZnSo4 heptahydrate, 500gm jar

## 24. DIURETICS

### 24.1. Acetazolamide

**Class**

Diuretics

**Action**

It is a reversible inhibitor of carbonic anhydrase enzyme that reduces the secretion of hydrogen ions in renal tubules and increases the excretion of renal potassium, sodium, bicarbonates and water.

**Indication**

Used in case of acidic urine and glaucoma

**Dosage**

2-5mg/kg BW TID

**Contraindication**

Avoid use in Addison's disease, pregnancy and during lactation.

Avoid in cats.

Brand Name	Manufacturer	MAH	Presentation
Diamox Tab	Pfizer Ltd	Medicocity (Direct)	250 mg tab, 10 tabs/strip

### 24.2. Frusemide

**Class**

Diuretics

**Action**

It acts by inhibiting the luminal sodium, potassium and chloride symporter thereby allowing free water clearance.

**Indication**

Chronic CHF, pulmonary edema and ascitis, localized edema, eg. mammary edema in cows; suppression of lactation in pseudopregnancy or normal lactation in bitches and queens; adjunct to digitalis therapy. Safe to

use during pregnancy.

**Dosage**

By IM or slow IV route once or twice daily

Horse & Cattle	1-2 mg/kg BW
Dog and cat	2-4 mg/kg BW BID
Pig	5 mg/kg BW

**Contraindication**

Contraindicated in anuria and in concurrent therapy with aminoglycoside antibiotics.

**Precaution**

Long term therapy may result in hypokalaemia, impaired renal or hepatic function.

Brand Name	Manufacturer	MAH	Presentation
Ridema	Vetoquinol India Animal Health Pvt Ltd	Karma PMS	Frusemide 50mg/ml, 10 ml vial

## 25. ANTI-CONVULSANTS

### 25.1. Diazepam

#### **Class**

Anticonvulsant & Sedative

#### **Action**

The anticonvulsant and muscle relaxation properties of diazepam are due to binding to voltage dependant sodium channels and inhibition of polysynaptic pathways in the spinal cord.

#### **Indication**

Convulsive disorders in foals (including neonatal seizures) and dogs (including status epilepticus); in strychnine poisoning; pre-anesthetic in horses (xylazine/ketamine) and dogs.

#### **Dosage**

By IM or slow IV route.

**Dogs** - Pre-anesthetic: 0.2 - 0.6 mg/kg (0.2 - 0.6ml/5kg)

Anticonvulsant; 1 ml/5kg slow IV

In status epilepticus, give initial 5mg dose; repeat after 1 - 2minutes if response is inadequate; give pentobarbital sodium 16.5mg/kg by slow IV if clinical signs persist after second diazepam injection

Strychnine poisoning: 1mg/kg (2ml/10kg) by slow IV; repeat dose by IM injection.

**Horse** - Pre-anesthetic: 12ml/450kg IM, 20 minutes prior to xylazine 1.1mg/kg by IV injection. Sedation and ataxia occur in 2 - 3minutes. Finalize induction with ketamine 2.2mg/kg by rapid IV injection.

Anticonvulsant: 1 - 4ml/50kg by slow IV in foals.

For convulsant seizures in neonatal foals give 5 - 20mg and repeat as necessary; higher doses may be fatal. Lack of response or rapid seizure reappearance following repeated diazepam doses will necessitate slow IV phenobarbital sodium injection.



### Contraindication

Use during gestation or pregnancy.

Take particular care to avoid injection into small veins or intra-arterial administration as phlebitis and thrombosis may result.

### Precaution

Give IV injection slowly; rapid administration may cause bradycardia and fatal cardiac arrest due to propylene glycol contents.

Brand Name	Manufacturer	MAH	Presentation
Lori	Neon Laboratories	KMT PMS	Diazepam 5 mg/ml, 2 ml Ampoule

## 25.2. Phenobarbitone sodium

### Class

Barbiturates

### Action

It acts by increasing the net chloride ions flux into the neurons thereby decreasing excitability. Also it directly blocks excitatory glutamate signaling.

### Indication

Symptomatic or prophylactic control of convulsive seizures, status epilepticus. The only choice of drug in convulsive seizures.

### Dosage

Dogs & cat: 2.2 – 6.6mg/kg body weight BID orally.

### Contraindication

Polyphagia, polydipsia, polyurea are the effects.

In toy breeds, whining is seen.

Brand Name	Manufacturer	MAH	Presentation
Gardenal* 30	Abbott Healthcare Pvt Ltd.	Medicocity (Direct)	Phenobarbitone 30 mg tab, 10 tabs/strip

## 25.3. Phenytoin

### Class

Hydantoin derivative anti epileptic/Antidysrhythmics

### Action

Phenytoin depresses motor areas of the cortex, without depressing sensor areas (hence no sedation). Stabilizing effects of phenytoin on all neural membranes, all peripheral neurons as well as non-excitabile membranes at synaptic junctions limits development of maximum seizure activity and reduce spread of seizure process. Also is antiarrhythmic.

### Indication

It is useful for prevention of tonic-clonic seizures and partial seizures. Intravenously it can be used for treatment of status epilepticus. It may also be used for certain heart arrhythmias and neuropathic pain.

### Dosage

Dogs: 8-17.6 mg/kg TID/QID.

### Contraindication

Polyphagia, Polydipsia, Polyuria.  
Contraindicated in Cats.

### Precaution

It inhibits insulin secretion so must be used with precaution.

Brand Name	Manufacturer	MAH	Presentation
Dilantin	Medopharm	KMT PMS	Phenytoin 10 mg tab, 1000 tabs/Jar

## 26. ANTI-EMETICS

### 26.1. Ondansetron

**Class**

Anti-emetic/Serotonin 5-HT<sub>3</sub> receptor antagonists

**Action**

Ondansetron is a serotonin 5-HT<sub>3</sub> receptor antagonist. It works by blocking the action of serotonin, a natural substance that causes nausea and vomiting.

**Indication**

Nausea & vomiting

**Dosage**

Dog & Cat - 0.5mg/kg BW IV; 0.5mg/kg BW/hr infusion for 6 hours; 0.5-1mg/kg BW orally OD or BID

**Precaution**

Ondansetron should not be used in animals known to have hypersensitivity to drugs and allergies.

Brand Name	Manufacturer	MAH	Presentation
Neomit-4	Uttaranchal Biotech Ltd	KMT PMS	4mg tab, 10 tab/strip

### 26.2. Metoclopramide

**Class**

Anti-emetics

**Action**

The antiemetic action of metoclopramide is due to its antagonist activity at D<sub>2</sub> receptors in the chemoreceptor zone in central nervous system (CNS). This action prevents nausea and vomiting triggered by stimuli.

**Indication**

Vomiting due to gastritis, esophageal reflux, impaction

**Dosage**

IM, IV, SC - Dog & Cat: 0.01 - 0.2mg/kg body weight.

**Contraindication**

Restlessness, excitement, extra pyramidal symptoms in young ones.

Brand Name	Manufacturer	MAH	Presentation
Remetin	Claris Lifesciences Ltd	Karma PMS	5 mg/ml, 10ml vial

**26.3. Promethazine****Class**

Anti-emetics/Tricyclic

**Action**

Promethazine blocks the action of acetylcholine (Anticholinergic effect), which explains its benefit in reducing nausea and motion-sickness.

**Indication**

Vomiting and allergic disorders

**Dosage**

Oral Route - Large animals: 1.5mg – 2mg body weight; Dogs: 1.5 – 2.5mg/kg body weight; Sheep and goat: 2mg/kg body weight

**Contraindication**

Sedation or CNS excitements, GI disturbances and teratogenic effects are the side effects. Higher doses may cause irritability, convulsions, hyperpyrexia, intestinal disorders, nausea, vomiting, constipation or diarrhea. Also potentiates the effect of CNS depressants. Administration along with epinephrine is contraindicated.

**Precaution**

Promethazine may cause severe drowsiness

Brand Name	Manufacturer	MAH	Presentation
Promethazine	NA	Medicocity	10mg tab, 10 tab/strip

## 27. CARDIAC STIMULANTS

### 27.1. Adrenaline

#### Class

Sympathomimetic (Alpha and Beta adrenergic agonist)

#### Action

It produces vasoconstriction to counteract the vasodilation and resulting hypotension associated with anaphylaxis.

#### Indication

For treatment of cardiac collapse, allergic and anaphylactic reactions, hemostasis, in cases of epistaxis in horses

#### Dosage

By slow IV or SC for cardiac collapse during anesthesia

Cattle & horse: 2 - 4ml IV or 2 - 8ml SC (8 - 17mcg/kg S/C or 4 - 8mcg/kg IV)

Dogs: 0.1 - 0.3ml IV or 1 - 0.5ml SC (10 - 30mcg/kg)

For allergic and anaphylactic reactions:

Cattle & horse: 4 - 8ml IV or SC

Dogs: 0.1 - 0.3ml IV or SC

Local application in capillary hemorrhage

#### Contraindication

Over dosage may cause cardiac dysrhythmias

Contraindicated in hyperthyroid patients, in thyroid and digitalis therapy and also with thiobarbiturate anesthesia

Brand Name	Manufacturer	MAH	Presentation
Vasocon	Neon Laboratories Ltd	KMT PMS	1 mg/ml, 1 ml amp* 10 amp/packet

### 27.2. Digoxin

#### Class

Digitalis Glycosides

**Action**

Digoxin inhibits the sodium-potassium-adenosine triphosphatase membrane pump mainly in the myocardium resulting in increased intracellular sodium. The sodium calcium exchanger in turn tries to extrude sodium and hence pumps in more calcium.

**Indication**

Atrial fibrillation, congestive heart failure, atrial flutter and paroxysmal tachycardia

**Dosage**

By oral route

Species	Total dose	Administration schedule	Daily maintenance dose
Dog	0.11 - 0.22 mg /kg	0.022 – 0.044mg/kg, 12 hourly for 48 hours	0.011mg/kg 12 hourly

Parenteral route

Dog	0.022 - 0.044mg/kg	3 divide doses over 24 hours	Oral digoxin 0.011 mg/kg 12 h
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**Contraindication**

Digitalis toxicity in over dosage.

May produce cardiac arrhythmias, anorexia, nausea, vomiting and diarrhea.

Blurred vision, neuralgic pain also noticed

**Precaution**

Not to be given in dogs with ventricular fibrillation.

Brand Name	Manufacturer	MAH	Presentation
Lanoxin	GlaxoSmithKline Pharmaceuticals Ltd	KMT PMS	0.250 mg tab, 10 tab/strip

## 28. BRONCHIO DIALATORS

### 28.1. Salbutamol

#### Class

Bronchodilator/Beta 2 adrenergic agonist

#### Action

Salbutamol stimulates beta 2 adrenergic receptors which are predominant receptors in bronchial smooth muscles of the lungs thereby relaxing the smooth muscles. It also inhibits the release of bronchoconstrictor mediators like histamine.

#### Indication

It is used to treat bronchial asthma. Respiratory stimulant used in depression from barbiturates and inhalant anesthetics. In neonates, it is administered into umbilical veins to stimulate respiration (SC or sublingually).

#### Dosage

IV, SC or sublingual

Dog & cat: 5 - 10mg/kg body weight

Horse: 0.5mg/kg body weight

#### Contraindication

Salbutamol is contraindicated in patients with pre-existing cardiac tachyarrhythmias.

#### Precaution

Salbutamol should be used with extreme caution in patients with cardiac arrhythmia, hypertension, hyperthyroidism and convulsive disorders.

Repeated administration may cause seizures.

Brand Name	Manufacturer	MAH	Presentation
Salbutamol sulphate tab IP 2MG	Ukay Remedies	Karma PMS	4 mg tab, 10 tab/strip

## 29. HEMOSTATIC DRUGS

### 29.1. Adenochrome monosemicarbazone

**Class**

Systemic hemostatic/Anti-hemorrhagic drug

**Action**

The drug acts as a hemostatic agent by reducing capillary fragility. It controls oozing from raw surfaces and prevent bleeding from microvasculature.

**Indication**

Pre or Post Operative hemorrhages, haemagalactia, hemorrhages of various origin such as epistaxis, haematuria, secondary hemorrhage from wounds, retinal hemorrhage, menorrhagia and metrorrhagia

**Dosage**

Large animals: 20-25mg (total dose) IM

Small animals: 5-10 mg (total dose) IM

**Contraindication**

Hepatic impairment

Avoid using with antihistamines

**Precaution**

Hypersensitivity to the drug.

Store below 25°C in airtight containers and protect from light.

Brand Name	Manufacturer	MAH	Presentation
Styptochrome	Medicocity	KMT PMS	5mg/ml; 10 ml vial

### 29.2. Ethamsylate

**Class**

Synthetic hemostatic drug

**Action**

It increases capillary endothelial resistance and promotes platelet adhesion. It also inhibits biosynthesis and action of those prostaglandins which cause



platelet disaggregation, vasodilatation and increased capillary permeability. Ethamsylate stops hemorrhage from small blood vessels by stabilizing the capillary wall and correcting abnormal platelet adhesion.

**Indication**

Pre-operative and post operative management, prophylaxis and control of hemorrhages from small blood vessels, capillary bleeding of different etiology, including: menorrhagia and metrorrhagia without organic pathology, hematemesis, melena, hematuria, and epistaxis.

**Dosage**

Large animals: 500 mg QID IM or IV

Dog & Cat: 250 mg QID IM or IV

**Contraindication**

Hypersensitivity, porphyria, pregnancy and lactation.

**Precaution**

Store below 25°C

Brand Name	Manufacturer	MAH	Presentation
ETHAWK®	Wockhardt	KMT PMS	125mg/ml; 2 ml ampoules

**29.3. Botrophase**

**Class**

Systemic haemocoagulant

**Action**

Aqueous hemocoagulase containing enzymes that causes proteolytic effect on circulating fibrinogen promoting physiological process of haemostasis.

**Indication**

Primary, secondary and post-operative internal and external hemorrhages.

**Dosage**

1 ml of botrophase contains 1 CU (Christensen Unit) of Botrophase

All animals: 1 ml IM 12 hourly

**Contraindication**

Hypersensitivity, arterial and venous thrombosis.

**Precaution**

Avoid overdosing of animals.

Store in cool dark place and protect from light.

Brand Name	Manufacturer	MAH	Presentation
Botrophase	Juggat Pharma	KMT PMS	Haemocoagulase ICU + Sodium chloride IP 0.9% per ml; 1 ml ampoule

## 30. EMETICS

### 30.1. Apomorphine hydrochloride

#### Class

Non-selective dopamine agonist and antagonist of 5-HT<sub>2</sub> and  $\alpha$ -adrenergic receptors.

#### Action

Apomorphine stimulates dopamine receptors in the chemoreceptor trigger zone inducing vomiting. It can cause both CNS depression and stimulation, but tends to cause more stimulatory effects. Medullary centers can be depressed with resultant respiratory depression

#### Indication

Apomorphine is used primarily as an emetic in dogs and cats. It is also used as an expectorant.

#### Dosage

Dog: 0.03 mg/kg IV or 0.04 mg/kg IM (IV route preferred)

Cat: 0.04 mg/kg IV or 0.08 mg/kg IM

#### Contraindication

Do not use in rodents or rabbits.

Do not use in patients who have previously vomited repeatedly or have ingested strong acids, or alkali.

Do not use in strychnine poisoning.

Do not use with barbiturates and phenothiazines.

#### Precaution

Store in tight containers at room temperature (15 – 30°C) and protected from light.

Discolored tablets or solutions (green to turquoise) should not be used.

Brand Name	Manufacturer	MAH	Presentation
Apomorphine	NA	NA	6.5 mg tab, 10x10 tabs

## 31. ANTIDOTES

### 31.1. Atropine sulphate

#### **Class**

Antimuscurinic/Anticholinergic agent

#### **Action**

Atropine sulphate competitively inhibits acetylcholine stimulants at postganglionic parasympathetic neuro-effector sites. High doses may block nicotinic receptors at the autonomic ganglia and at the neuromuscular junction.

#### **Indication**

As pre-anesthetic in dogs, cat, & pig to decrease secretions of the respiratory tract, treatment of sinus bradycardia, sino-atrial arrest, and incomplete AV block, as an antidote for overdoses of cholinergic agents (e.g. physostigmine) and organophosphate, carbamate, muscarinic mushroom, blue-green algae intoxications. As an antispasmodic in treating diarrhea & colic.

#### **Dosage**

##### ***Dog:***

As pre-anesthetic - 0.022 – 0.044 mg/kg IM/SC

Treatment of bradycardias, incomplete AV block - 0.022 – 0.044 mg/kg IM, SC, or IV or 0.04 mg/kg PO QID

Treatment of cholinergic toxicity - 0.2 – 2 mg/kg (give one fourth of the dose IV and the remainder SC or IM)

Treatment of broncho-constriction - 0.02 – 0.04 mg/kg

##### ***Cat:***

As pre-anesthetic - 0.022 – 0.044 mg/kg IM or SC

Treatment of bradycardias - 0.022 – 0.044 mg/kg IM, SC, or IV or 0.04 mg/kg PO QID

Treatment of cholinergic toxicity - 0.2 – 2 mg/kg (give one fourth of the dose IV and the remainder SC or IM)

##### ***Small mammals (Rabbits, Rodents etc):***

Prevention of bradycardia and to decrease airway secretions - 0.04 – 2 mg/kg; re-dosed q10 – 15 minutes as needed to produce mydriasis.

Treatment of organophosphate toxicity - 10 mg/kg SC q20 minutes

##### ***Cattle:***

As pre-anesthetic - 0.06 – 0.12 mg/kg IM (only in emergencies)

Treatment of organophosphates poisoning - 0.5 mg/kg (give one fourth of the dose IV and the remainder SC or IM); may repeat q3 – 4h for 1 – 2 days

**Horses:**

Treatment of bradyarrhythmias - 0.01 – 0.02 mg/kg IV

As a bronchodilator - 5 mg IV for a 400 – 500 kg animal

Organophosphate poisoning - 0.22 mg/kg (give one fourth of the dose IV and the remainder SC or IM)

**Pigs:**

As pre-anesthetic - 0.04 mg/kg IM

Organophosphate poisoning - 0.22 mg/kg (give one fourth of the dose IV and the remainder SC or IM)

**Sheep & Goats:**

As pre-anesthetic - 0.15 – 0.3mg/kg IM (only in emergencies)

Treating organophosphate toxicity - 0.5 mg/kg (give one fourth of the dose IV and the remainder SC or IM); may repeat q3 – 4h for 1 – 2 days

**Birds:**

Organophosphate poisoning - 0.1 – 0.2 mg/kg IM or SC

Treatment of bradycardia - 0.02 mg/kg IV.

As pre-anesthetic - 0.04 – 0.1 mg/kg IM or SC once

**Contraindication**

Hypersensitivity to anticholinergic drugs, tachycardias, GI obstructive disease, severe colitis, hepatic or renal disease, obstructive uropathy and myasthenia gravis or esophageal reflux.

Atropine aggravates amitraz toxicity.

Use of atropine in cattle may result in in-appetence and rumen stasis.

Do not use pralidoxime in carbamate poisonings.

**Precaution**

Atropine sulfate tablets or injection should be stored at room

Brand Name	Manufacturer	MAH	Presentation
Tropine	Neon Laboratories	KMT PMS	Atropine 1 mg/ml, 10 ml vial

## 32. ANTIDIARRHEALS

### 32.1. Loperamide

#### Class

A synthetic piperidine derivative and non-addictive opioid anti-diarrheal analgesic agent

#### Action

Loperamide is an opioid-receptor agonist and acts on the  $\mu$ -opioid receptors in the mesenteric plexus of the large intestine decreasing the activity and allowing more water to be absorbed from the fecal matter. Loperamide suppresses the gastrocolic reflex.

#### Indication

Treatment of acute & chronic non-specific diarrhea, irritable bowel syndrome, chronic diarrhea due to bowel resection and chronic diarrhea secondary to inflammatory bowel disease. Off-label uses for loperamide include chemotherapy induced diarrhea.

#### Dosage

Dog and cat- 0.11 - 0.22 mg/kg body wt orally

#### Contraindication

Do not use in animals hypersensitive to opiates/narcotics.

Caution in patients with hypothyroidism, kidney disease, hypoadrenocorticism, respiratory disease, gastrointestinal obstruction, urinary obstruction or liver disease.

Do not use in pregnant or nursing animals and in infectious diarrhea such as those caused by *Salmonella*.

#### Precaution

Rare allergic reactions including anaphylaxis and anaphylactic shock.

Store at room temperature in tightly closed container.

Brand Name	Manufacturer	MAH	Presentation
Loperamide Tab	Ukay Remedies	Karma PMS	2 mg tab, 10 tab/strip

## 32.2. Metronidazole and Loperamide

### Class

Nitroimidazole antibiotic and antiprotozoal with opioid anti-diarrheal analgesic agent

### Action

Nitroimidazole is reduced by redox proteins present only in anaerobic organisms to reactive radical that exerts cytotoxic effect by destabilizing DNA helix while loperamide inhibits the release of acetylcholine on mesenteric plexus in the GI tract.

### Indication

Treatment of diarrhea due to amoebiasis and giardiasis. Effective against trichomoniasis, enterocolitis, ulcerative gingivitis, helicobacter pylori infections, bacterial infections after surgery, brain abscess, endocarditis and Balantidium infection in Swine.

### Dosage

Small animals: 1-2 boli/day for 3- 5 days

Large animals: 4-6 boli/day for 3 -5 days

### Contraindication

Hypersensitivity, severe diarrhea and blood dyscariasis and CNS disorders. Do not use in bloody diarrhea.

### Precaution

Store in tightly closed container in cool and dry place.

Protect from heat and light

Brand Name	Manufacturer	MAH	Presentation
MF-3	Ukay Remedys Pvt Ltd	KMT PMS	1000mg of metronidazole and 7.5 mg of loperamide, 4 tab/strip

## 33. ANTINEOPLASTIC DRUGS

### 33.1. Lithium Antimony Thiomalate

#### **Class**

Anthelmintics, Anti-neoplastic drug

#### **Action**

Trivalent organic antimonial containing 16 per cent of antimony. Trivalent antimony compounds inhibit phosphofructokinase in schistosomes causing paralysis of parasites

#### **Indication**

For the treatment of tropical nasal granuloma (schistosomiasis) in cattle, filariasis and Leishmaniasis in dogs and papillomatosis in cattle and horses.

#### **Dosage**

##### ***Cattle & horses:***

Nasal granuloma - 20ml deep IM on 2 to 3 occasions at intervals of one week by deep IM;

Papillomatosis - 15ml deep IM on 4 to 6 occasions at intervals of 2 days.

##### ***Dogs:***

Filariasis and Leishmaniasis - 1ml IM raising by increments of 0.5ml to 2.5ml. Injection should be given on alternate days on 4 to 6 occasions.

#### **Contraindication**

Pregnancy or impeditive diseases

#### **Precaution**

Do not give by SC injection as it causes area of lightening around the site of injection.

Store between 2 - 8°C. Do not freeze.

Protect from light.

Brand Name	Manufacturer	MAH	Presentation
Anthiomaline	Novartis	Medicocity (Direct)	50ml vial



## 33.2. Methotrexate sodium

### Class

Antimetabolite

### Action

It binds to dihydrofolate reductase, interfering with folic acid metabolism and inhibiting DNA synthesis and cellular replication (slowing or stopping the growth of cancer cells) and suppresses the immune system.

### Indication

For treatment of rheumatoid arthritis, lymphomas and solid tumors in dogs and cats, transmissible venereal tumors (TVT) and sertoli cell tumors. This can also be used for lupus and psoriatic arthritis.

### Dosage

Dog: 2.5 mg/m<sup>2</sup> orally OD followed by 5.0 mg/m<sup>2</sup> orally on days 1 and 5 of a biweekly maintenance schedule

Cat: 2.5-5.0 mg/ m<sup>2</sup> PO two to three times weekly

### Contraindication

Pre-existing bone marrow depression, severe hepatic and renal insufficiency and pregnancy

### Precaution

Hypersensitive to the drug.

Wear gloves while handling the drug.

Brand Name	Manufacturer	MAH	Presentation
Mext 2.5	Wallace LifeStyle	KMT PMS	50ml vial

## 33.3. Vincristine Sulphate

### Class

Plant (vinca) alkaloid antineoplastic/cytotoxic drug

### Action

Block cell division and interfere with synthesis of nucleic acid. Vincristine attacks the cells during various phases of division (cell-cycle-phase specific).

## Indication

Transmissible venereal tumor, Lymphosarcoma, malignant lymphoma, multiple myeloma and Immune thrombocytopenia.

## Dosage

Dogs and cats:

- ❖ Transmissible venereal tumors - 0.025mg/kg once weekly x 4. IV
- ❖ Immune thrombocytopenia - 0.01-0.025 mg/Kg IV in every 7-10 days, by IV route only, either directly into the vein or into the tubing of a running IV infusion, injection being accomplished within one minute.

## Contraindication

Exercise extreme caution in pregnant animals.

Intrathecal administration of vincristine sulphate is fatal.

## Precaution

Store the drug between 2 - 8° C. Do not freeze. Protect from light.

Do not dilute in solutions that raise or lower the pH outside the range of 3.5 - 5.5.

Do not mix with anything other than normal saline or glucose in water.

Avoid contact with eyes.

Extreme care must be used in calculating and administering the dose of vincristine sulphate since over dosage have serious or fatal.

Brand Name	Manufacturer	MAH	Presentation
Onvinc-1	Neon Laboratories	KMT PMS	Each vial contains 1 mg of vincristin sulphate (anhydrous) & 50mg of Lactose.

## 34. PSYCHOTROPIC DRUGS

### 34.1. Chlorpromazine Hydrochloride

#### Class

Phenothiazine sedative/antiemetic and antipsychotic agent

#### Action

Chlorpromazine blocks the dopamine receptors in central nervous system.

#### Indication

For pre-medication in anesthesia, sedation, control of nausea and vomiting and colic in horses. It can also be used as preoperative medication and tranquilizer. As an antiemetic, chlorpromazine will inhibit apomorphine induced emesis in the dog but not the cat.

#### Dosage

**Dog:** Antiemetic - 0.5 mg/kg IV, IM or SC three to four times daily

Sedative - 3 mg/kg PO q12h or 0.5 mg/kg IM or IV q12h

Pre-anesthetic - 1.1 mg/kg IM 1 – 1.5 hours prior to surgery

Muscle relaxant - 2 mg/kg IM twice daily (during tetanus)

Treatment for amphetamine toxicosis - 10 – 18 mg/kg IV

**Cat:** Antiemetic - 0.5 mg/kg IV, IM or SC three to four times daily

Sedative/restraining - 3 mg/kg PO OD or 0.5 mg/kg IM or IV OD

Pre-anesthetic - 1.1 mg/kg IM 1 – 1.5 hours prior to surgery

**Cattle:** Premedication for standing procedures - 1 mg/kg IM

**Pig:** Premedication - 1 mg/kg IM

Restraint - 1.1 mg/kg IM

Pre-anesthetic to barbiturate - 2 – 4 mg/kg IM

**Sheep & Goat:** 0.55 – 4.4 mg/kg IV or 2.2 – 6.6 mg/kg IM

#### Contraindication

Not recommended for use in horses. Use strictly by IV in rabbits. Do not use in patients with shock and strychnine poisoning. IV injections must be diluted with saline to concentrations of no more than 1 mg/ml and administered slowly.

Brand Name	Manufacturer	MAH	Presentation
Chlorpromazine Tab	Kansas Laboratories	KMT PMS	100mg/tab, 10tab/strip

## 35. TOXOIDS & ANTITOXINS

### 35.1. Tetanus toxoid

#### Class

Vaccine

#### Action

Induces protective levels of serum antitoxin that persists for 10 or more years. Tetanus toxoid is an inactivated concentrated vaccine containing 150 IU purified tetanus toxoid per dose in isotonic sodium chloride solution. The vaccine is clear or slightly turbid in appearance.

#### Indication

For vaccination of healthy horses, cattle, sheep, goats and swine against tetanus

#### Dosage

For horses, cattle, sheep, pigs and dogs: 1 ml per animal IM.

Can be used during pregnancy and lactation.

For primary immunization two doses should be administered subcutaneously or intramuscularly approximately 30 days apart.

Annual “booster” vaccination is recommended.

#### Contraindication

Do not use in sick, animals with heavy parasitic infestation or animals with poor general condition.

#### Precaution

Use IM for horses as local reactions are more likely to occur if injected subcutaneously. Adverse reactions are very rare. A transient swelling at the injection site up to 3 cm in diameter, lasting for 2 to 3 days, may occur. A slight increase in body temperature, up to 1.5°C, may be observed the day following vaccination. Do not vaccinate animals intended for food within 21 days before slaughter. Store between +2°C and + 8°C. Allow the vaccine to reach room temperature (15-25°C) before use. Shake the vial before use.

Brand Name	Manufacturer	MAH	Presentation
Bett	Biological E. Ltd	KMT PMS	0.5ml

## 35.2. Tetanus antitoxin

### **Class**

Hyperimmune serum of equine origin

### **Action**

Tetanus antitoxin neutralizes tetanus antigen in non-immunized animal, or whose immune status is unknown. Tetanus can result from deep penetrating wound that has or may become contaminated with soil, animals following castration, docking, and other operations performed on premises upon which tetanus infection has been a problem.

### **Indication**

Used in the prevention and treatment of tetanus in animals.

### **Dosage**

For prevention of tetanus 1500 units of anti toxin should be given subcutaneously or intramuscularly.

For treatment; administer 10,000 to 50,000 units to horses and cattle, 3,000 to 15,000 units to sheep and swine.

Animals that suffer slow healing puncture wounds or deep abrasions should be given a second dose of antitoxin in 7 days and additionally as considered necessary.

### **Contraindication**

Do not vaccinate within 21 days before slaughter. Anaphylactic reaction may occur following administration of products of this nature.

### **Precaution**

Store at 2° - 7° C. Do not freeze. Use entire contents when first opened.

Brand Name	Manufacturer	MAH	Presentation
Tetanus toxin	NA	NA	1500 IU/ml

## 36. MISCELLANEOUS

### 36.1. Distilled water

**Class**

Water

**Action**

Diluents or dissolving drugs for parenteral injection

**Indication**

This parenteral preparation is indicated only for diluting or dissolving drugs for intravenous, intramuscular or subcutaneous injection, according to instructions of the manufacturer of the drug to be administered.

**Dosage**

The volume of the preparation to be used for diluting or dissolving any drug for injection is dependent on the vehicle concentration, dose and route of administration as recommended by the manufacturer.

**Precaution**

When diluting or dissolving drugs, mix thoroughly and use promptly. Do not store reconstituted solutions of drugs for injection unless otherwise directed by the manufacturer of the solute.

Parenteral drug products should be inspected visually for particulate matter and discoloration prior to administration, whenever solution and container permit. Intravenous administration of sterile water for Injection without a solute may result in hemolysis. Use only preservative-free Sterile Water for Injection in newborn.

Reactions may occur after administration such febrile response, local tenderness, abscess, tissue necrosis or infection at the site of injection, venous thrombosis or phlebitis extending from the site of injection and extravasations.

Brand Name	Manufacturer	MAH	Presentation
SuperAmp	Claris Lifesciences Ltd	Karma PMS	5ml amp, 50 ampoules/pkt

**SECTION B**  
**POULTRY DRUGS**

## 37. POULTRY DRUGS

### 37.1. Antibiotics for Avian Species

#### 37.1.1. Amikacin

##### **Class**

Aminoglycosides, Broad spectrum antibacterial

##### **Action**

The aminoglycoside are rapidly bactericidal, they act directly on the bacterial ribosome, where they inhibit protein synthesis and decrease the fidelity of translation of the genetic code.

##### **Indication**

Chronic respiratory disease (CRD) Bronchitis, *E. Coli*, *Salmonella* infections & prevention of early chick mortality.

##### **Dosage**

Poultry - 20 mg/kg BW by SC injection for 3-5 days

Parrots, Raptors -10–20 mg/kg BW, 8–12 hr

Ostriches - 7.6 mg/kg q8hr

##### **Contraindication**

Use in conjunction with frusemide may potentiate renal damage

##### **Precaution**

Birds should be thoroughly hydrated throughout the treatment period to decrease possibility of nephrotoxicity.

Brand Name	Manufacturer	MAH	Presentation
Amikin	Vetsfarma Ltd	KMT PMS	100ml bottle

#### 37.1.2. Cephalexin

##### **Class**

Cephalosporins



**Action**

It inactivates the enzyme trans-peptidase that is responsible for the synthesis of the bacterial cell wall.

**Indication**

Treatment of Coryza, Fowl Typhoid, Fowl Cholera, Bacillary White Diarrhea, *E.Coli*, and Gangrenous Dermatitis and to combat secondary infection associated with viral diseases and prevention of early chick mortality.

**Dosage**

Poultry, Turkey - 35–50 mg/kg BW QID

**Contraindication**

Avoid using in penicillin hypersensitive birds

**Precaution**

Do not use cephalixin along with penicillin antibiotics

Brand Name	Manufacturer	MAH	Presentation
Ceflax	Neospark Drugs and Chemicals Pvt. Ltd	NA	20 gm sachet
Cephalexin veterinary oral powder	Virbac Animal Health India	KMT PMS	20 m sachet

**37.1.3. Tetracycline + Erythromycin + Vitamin combinations****Class**

Broad spectrum antibiotics and macrolides

**Action**

The antimicrobial activity of tetracycline reflects reversible binding to the bacterial 30S ribosomal subunit, and specifically at the aminoacyl-tRNA acceptor ("A") site on the mRNA ribosomal complex, thus preventing

ribosomal translation in the bacterial nucleus. The erythromycin inhibits the synthesis of protein by reversibly binding to 50S subunit of the ribosome.

**Indication**

To prevent CRD, coryza, white bacillary diarrhea, fowl typhoid, psittacosis, combat secondary bacterial infection in viral diseases, during physical stress

**Dosage**

Prevention - 2.5 gm/4.5 litres of water

Treatment - 5gm/4.5 litres of water

**Precaution**

Prepare fresh solutions daily, when Tetracycline is given to poultry through drinking water, no other water should be given.

The above dosage can be increased or doubled depending upon the severity of infection.

The treatment should be continued for at least 24 hours after the symptoms disappear.

A withdrawal period of 5 days should be followed if it's to be slaughtered for consumption.

Brand name	Manufacturer	MAH	Presentation
Tetracycline Hydrochloride, Erythromycin and Vitamin powder	Hester Biosciences Limited	Medicocity (Direct)	100 gm sachet

**37.1.4. Sulphadiazine (Combination with Diaminopyrimidines)**

**Class**

Sulphonamides, antibacterial

**Action**

The sulfonamides are structural analogues of para-aminobenzoic acid (PABA) and competitively inhibit dihydropterate synthetase, an enzyme

that facilitates PABA as a substrate for the synthesis of dihydrofolic acid (folic acid) in the bacteria.

### **Indication**

Collibacillosis (dyspnea, air sac, heart and liver covered by fibrinous membranes), coryza, fowl cholera (greenish droppings, swelling of wattle and comb), salmonellosis (whitish droppings, necrotic and heart congestion), staphylococcosis (foul smelling watery diarrhea, paralysis, joint swelling), streptococcosis (yellow colored feces, wattle and comb pale, head tremor) and CRD

### **Dosage (With different combinations)**

#### ***Sulphadiazine+Trimethoprim***

- ❖ Most species-30 mg/kg BW BID orally
- ❖ Raptors, Waterfowl (*Coccidia*) - 60 mg/kg BW BID treat for 3 days, 2 days off medication and treat for 3 days

#### ***Sulphamethaoxazole+Trimethoprim***

- ❖ For *Coccidia* - 25 mg/kg BW daily

#### ***Sulphaquinoxaline+Trimethoprim***

- ❖ Broiler chickens and Turkeys - 30 mg/kg

### **Contraindication**

Sulfonamide solutions are incompatible with calcium or other polyionic containing fluids as well as many other preparations

Sulfonamides may be displaced from their plasma-protein-binding sites by other acidic drugs with higher binding affinities

Antacids tend to inhibit the GI absorption of sulfonamides

Alkalinization of the urine promotes sulfonamide excretion, and urinary acidification increases the risk of crystalluria

### **Precaution**

Stop giving potentiated sulphonamides 5 days before poultry is slaughtered for human consumption

A course of treatment should not exceed 7 days under usual circumstances

Adequate drinking water should be provided during the treatment period

Brand Name	Manufacturer	MAH	Presentation
Safeprim	Safecon Lifesciences	Paras PMS	100 gm sachet
Collimezyn	Medion	KMT PMS	250 gm sachet
Respiratrek	Medion	KMT PMS	1L bottle

### 37.1.5. Levofloxacin/Enrofloxacin

#### Class

Quinolones, synthetic broad spectrum antimicrobial

#### Action

The quinolones inhibit bacterial enzyme topoisomerases, including topoisomerase II (otherwise known as DNA gyrase) and topoisomerase IV. Bacterial DNA super coils and then uncoils during replication.

#### Indication

CRD/air sac disease, colibacillosis, salmonellosis (Pullorum), Pasteurellosis (Fowl cholera), Necrotic/ulcerative enteritis, clostridium disease like bronchitis and secondary bacterial infections associated with viral diseases

#### Dosage

Levofloxacin

- ❖ Preventive - 7.5-10mg/kg BW od in drinking water

Enrofloxacin

- ❖ Parrots, pigeons - 7.5–20 mg/kg BW od
- ❖ Most species - 15 mg/kg BW BID may be given SC
- ❖ Chickens, turkeys, game birds - 50–100 mg/l drinking water

#### Contraindication

Antacids or other drugs containing multivalent cations and sucralfate appear to interfere with the GI absorption of the quinolones. Nitrofurantoin impairs the efficacy of quinolones if used concurrently for urinary tract infections.

Brand Name	Manufacturer	MAH	Presentation
Meditril-K	Medion	KMT PMS	10 capsules or 50 capsules/jar
Livocin	Vetsfarma	KMT PMS	100 ml per vial/ 100 gm/1 kg sachet/1L jar
Neo Meditril	Medion	KMT PMS	250 ml bottle/1L bottle
Enflox	Vetindia	Vetline PMS	100 ml bottle, 1L jar
Neo Meditril-I	Medion	KMT PMS	100 ml bottle
Enrovet	Vetsfarma	KMT PMS	100 ml/500 ml/1L jar
Xester-Bh	Hester Biosciences Ltd	KMT PMS	1L/5L jar

### 37.1.6. Amoxicillin trihydrate and colistin combination

#### Class

Peptidoglycan antibacterial and polymyxins (polypeptide antibiotic)

#### Action

Amoxicillin inhibits the peptidoglycan network development in the bacteria cell wall; while the Polymyxins are bactericidal; they interact strongly with phospholipids in bacterial cell membranes and radically disrupt their permeability and function.

#### Indication

Gastrointestinal, respiratory and urinary tract infections caused by amoxicillin and colistin sensitive micro-organisms, like *Campylobacter*, *Clostridium*, *Corynebacterium*, *E.coli*, *Erysipelothrix*, *Haemophilus*, *Pasteurella*, *Salmonella*, penicillinase negative *Staphylococcus* and *Streptococcus* spp.

#### Dosage

##### *Amoxicillin trihydrate*

- ❖ Pigeons - 100–200 mg/kg BW 12 hr

- ❖ Poultry - 55–110 mg/kg BW bd
- ❖ Most species - 100 mg/kg BW TID
- ❖ Parrots - 150–175 mg/kg BW BID

### ***Colistin***

- ❖ Treatment - 1gm/5L of drinking water
- ❖ Prevention - 60-100 gm/ton of feed for 20 days
- ❖ Salmonellosis - 1gm/5L of drinking water for 7 days

### ***Combination***

- ❖ Layers and Broiler - 250gm/ton of feed
- ❖ Breeders - 1kg/ton of feed
- ❖ Treating necrotic enteritis - 2kg/ton of feed

### **Contraindication**

Hypersensitivity to amoxicillin and/or colistin

Administration to animals with a seriously impaired renal function

Concurrent administration of tetracyclines, chloramphenicol, macrolides and lincosamides

Administration to animals with an active microbial digestion

### **Precaution**

Nephrotoxic in prolonged use

Muscular weakness, paresis, leading to respiratory arrest and death may occur if used in combination with other neuromuscular agent

Brand Name	Manufacturer	MAH	Presentation
Colidox	Vetcare	NA	500gm/5 kg sachets
Labbro Mix	Virbac	KMT PMS	1kg/5 kg sachets
Amoxitin	Medion	KMT PMS	100 gm sachet
Colyxicillin	Trifarma	NA	100 gm jar

## **37.1.7. Tylosin and Doxycycline combination**

### **Class**

Tetracycline and macrolides

## **Action**

Tetracycline prevents ribosomal translation in the bacterial nucleus and macrolides inhibits protein synthesis through binding to the 50S subunit of the bacterial ribosome.

## **Indication**

The combination of Tylosin and Doxycycline acts additive. Doxycycline act against many gram positive and gram negative bacteria like *Bordetella*, *Campylobacter*, *E.Coli*, *Haemophilus*, *Pasteurella*, *Salmonella*, *Staphylococcus* and *Streptococcus* spp. Doxycycline has great affinity to the lungs and is therefore especially used for treatment of bacteria respiratory infections. Tylosin act against mainly gram-positive bacteria like *Campylobacter*, *Mycoplasma*, *Pasteurella*, *Staphylococcus*, *Streptococcus* and *Treponema* spp.

## **Dosage**

### ***Tylosin***

- ❖ Pigeons - 25 mg/kg BW QID
- ❖ Most species - 50 mg/l drinking water
- ❖ Poultry - 110mg/kg BW

### ***Doxycline***

- ❖ 1gm/2L water on 1<sup>st</sup> day and 1gm/4L water on 2<sup>nd</sup> and 3<sup>rd</sup> day

## **Combination**

- ❖ 1 kg/1000-2000 L water for 3-5 consecutive days

## **Contraindication**

Should not be administered to hypertensive birds to any other tetracycline and other macrolides drugs.

## **Precaution**

Prolong treatment of the birds may result in growth of the non-susceptible organism (including fungi growth) which could lead to super infection.

Brand Name	Manufacturer	MAH	Presentation
Tylosafe	Safecon Biosciences	Paras PMS	100 gm sachet
Tyloadox	Medion	KMT PMS	50 m sachet

## 37.2. Anthelmintic Drugs for Avian Species

### 37.2.1. Albendazole/Fenbendazole/Thiabendazole

#### **Class**

Benzimidazole, broad spectrum anti-parasitic drugs

#### **Action**

The benzimidazoles inhibit tubulin polymerization; Inhibition of secondary events appears to play an essential role in the lethal effect on worms. Benzimidazoles progressively deplete energy reserves and inhibit excretion of waste products and protective factors from parasite cells; therefore, an important factor in their efficacy is prolongation of contact time between drug and parasite.

#### **Indication**

Active against adult and larval nematodes, ovicidal and to some extent effective against tape worm.

#### **Dosage**

##### ***Fenbendazole (Adult and larval nematodes)***

- ❖ Most species - 0–100 mg/kg once
- ❖ Poultry bird - 1.5–3.9 mg/kg BW od × 3days
- ❖ Ostriches - 15–45 mg/kg BW
- ❖ Waterfowl - 5–15 mg/kg BW od × 5 days
- ❖ Pigeons - 10–12 mg/kg q 24 hr × 3 days
- ❖ Parrots - 15 mg/kg BW od × 5 days

##### ***Mebendazole (GI roundworms, gapeworms and tapeworms)***

- ❖ Raptors - 25 mg/kg BW bd × 5 days repeat after 30 days (intestinal nematodiasis)
- ❖ Parrots - 25 mg/kg BW bd × 5 days (Nematodes)



- ❖ Pigeons - 5–6 mg/kg BW od × 3–5 days repeat in 21 days
- ❖ Ostriches - 5–7 mg/kg body weight
- ❖ Waterfowl - 5–15 mg/kg BW od × 2 days (Nematodes)

**Thiabendazole (Round worms, gape worms)**

- ❖ Most species - 40–100 mg/kg BW od × 7 days
- ❖ Pheasants, cranes - 425 mg/kg feed × 14 days

**Precaution**

Prolong use of these drugs could lead to resistance development by parasites

Brand Name	Manufacturer	MAH	Presentation
Oxzol	Vetsfarma	KMT PMS	100 ml, 1L jar
F-Zol	Vetindia	Vetline PMS	120 gm sachet
Albomar	Virbac	KMT PMS	300 gm sachet, 90 and 500 ml bottle
Analgon	Vetoquinol	Karma PMS	1, 5L bottle

**37.2.2. Levamisole and combination**

**Class**

Imidazothiazole derivative

**Action**

At higher concentrations, levamisole interferes with nematodal carbohydrate metabolism where it blocks fumarate reductase and succinate oxidase. It causes nicotinic stimulation of ganglia and CNS in susceptible worms. Parasites are paralyzed and expelled alive.

**Indication**

Effective against intestinal nematodes, adult and larval forms.

**Dosage**

- ❖ Most species - 20 mg/kg once
- ❖ Waterfowl - 20–50 mg/kg once
- ❖ Parrots and raptors - 100–200 mg/l drinking water × 3 days

- ❖ Pigeons - 1 tablet of 20 mg per pigeon

### Contraindication

Do not use in birds with known hypersensitivity to the active ingredients  
 Birds should not be treated with in a period of 14 days before or after treatment with organophosphorus compounds. (Organophosphorus compounds are chemical compounds containing carbon-phosphorus bonds, primarily used in pest control)

### Precaution

Use the product in recommended doses

Over dosing may cause head shaking, salivation and slight muscle tremors

Brand Name	Manufacturer	MAH	Presentation
Anide-L	Vetindia	Vetline PMS	1000 ml jar
Flunil-L	Vetsfarma	KMT PMS	1L jar
Ventrimisole	Venkys	NA	100, 500 gm sachet

### 37.2.3. Piperazine

#### Class

Narrow spectrum nematocide drugs

#### Action

Piperazine acts on the musculo-skeletal system of the helminths to cause paralysis mediated by chloride-dependent hyperpolarization of the muscle membrane. This results in expulsion of the worm.

#### Indication

Effective against adult round worms (*Ascaridia*, *Stroglyoides*, *Capillaria*)

#### Dosage

- ❖ Raptors - 100 mg/kg BW repeat in 14 days
- ❖ Pigeons (ascarids) - 35 mg/kg BW od × 2 days

- ❖ Emus, ostriches, chickens - 50–100 mg/kg BW once
- ❖ Turkey: <12 week - 100mg/kg BW and > 12 week old- 200mg/kg BW
- ❖ Water fowl (*Tetrameres* spp, *Capillaria* spp) - 45–200 mg/kg BW once
- ❖ Game birds - 100–500 mg/kg BW once, repeat in 10–14 days

### Precaution

Piperazine derivatives have no “**residual effect**”. This means that a single administration will kill the parasites present in the host at the time of treatment, but it will not protect against re-infestations.

Since it is not effective against larvae in the host tissues outside the gastrointestinal tract, re-treatments may be required to ensure control of certain species.

Brand Name	Manufacturer	MAH	Presentation
Cacing Exitor	Medion	KMT PMS	10 capsules/sachet
Knock-45	Zydus AHL	Karma PMS	500 ml, 5L jar
Piperazine Adipate	Neospark	NA	15 gm, 500 gm, 1 kg sachet

### 37.2.4. Praziquantel and pyrantel combination

#### Class

Isoquinolones and tetrahydropyrimidine, narrow spectrum taenicide and nematocide drugs

#### Action

The molecular mode of action of praziquantel is not precisely known at present. In tapeworms it seems to affect carbohydrate metabolism and to damage the worm's tegument structures. As a consequence the parasites cannot avoid being digested by the gastric fluids of the host. Pyrantel act on the nervous system of the worms as inhibitors of acetyl cholinesterase (AchE), an enzyme that hydrolyzes acetylcholine (Ach). The worms are paralyzed and die more or less quickly and expelled out.

## Indication

Effective against tapeworms and nematodes in the intestine

## Dosage

### *Praziquantel (Tape worms)*

- ❖ Most species - 10–20 mg/kg BW, repeat after 10–14 days
- ❖ Cranes - 6 mg/kg BW repeat in 10–14 days
- ❖ Ostriches - 7.5 mg/kg BW

### *Pyrantel (Nematodes/Round worms)*

- ❖ 15-25mg/kg BW

## Precaution

Praziquantel and pyrantel has **no residual effect**. This means that a single administration will kill the parasites present in the host at the time of treatment, but **will not protect the host against re-infestations**.

Praziquantel and pyrantel has **no efficacy** whatsoever against roundworms (nematodes) and tapeworms respectively.

Brand Name	Manufacturer	MAH	Presentation
Mediworm Pdr	Medpet Pvt Ltd	KMT PMS	100 gm/250 gm jars
Mediworm Tab	Medpet Pvt Ltd	KMT PMS	100 Tablets/jar

## 37.3. Anti-protozoal Drugs for Avian Species

### 37.3.1. Amprolium and combinations

## Class

Thiamine analogue, coccidiostat drugs

## Action

Amprolium prevents coccidia from utilizing thiamine by blocking thiamine receptors.

## Indication

Effective against *E. tenella*, *E. necatrix* and *E. acervulina* and first generation of trophozoites and schizonts but mostly it is used in

combination with other drugs to enhance its efficacy since *E.maxima* and *E. mitis* are resistant to it.

**Dosage**

- ❖ Pigeons - 25 mg/kg BW od
- ❖ Raptors - 30 mg/kg BW od × 5 days
- ❖ Most species - 50–100 mg/l drinking water × 5–7 days

Brand Name	Manufacturer	MAH	Presentation
Amprolium+ Sulphaquinoxaline powder	Medion	Paras PMS	Amprolium 100g + Sulphaquinoxaline 100g + Vit K3 2g, 100 gm sachet

**37.3.2. Sulphaquinoxaline and combinations**

**Class**

Sulphonamides, broad spectrum drugs

**Action**

Sulfonamides competitively inhibit dihydropteroate synthase, the enzyme which catalyzes the incorporation of PABA into dihydrofolic acid.

**Indication**

These drugs are used for both the prevention and treatment of coccidiosis outbreaks in all species. They are more effective against the intestinal than cecal species of coccidia. Their peak activity is against the second-generation schizonts.

**Dosage**

***Sulphaquinoxaline***

- ❖ 0.5% in feed and 0.043% in drinking water for duration of 2 days with 3-5 days interval

***Suphadimidine***

- ❖ 0.4% in feed and 0.2% in drinking water daily

Brand Name	Manufacturer	MAH	Presentation
Embazin	Medpet Pvt Ltd	NA	Sulphaquinoxaline 9.61%, 100ml/500 ml bottle
Super Cox	Vetoquinol	Karma PMS	Each kg contains sulfamethazine 200g +

			sulfaquinoxaline 25g + trimethoprim 65g + oxytetracycline 200g + vitamin A 5000000IU + vitamin K 5g, 100 gm sachet
DUAPRIM Powder	Brihans	Karma PMS	Trimethoprim IP 400 mg+Sulphamethoxazole IP 2000 mg per bolus, 15gm/60gm/150 gm sachets
Medicox	Medpet Pvt Ltd	NA	Sulphadimethoxine 25gm, 100 gm jar
Chlorazine	Ukay Remedys	KMT PMS	Sulphachlorpyrazine Sod. Salt 30gm/100gm, 100 gm sachet
Diquinox	Ukay Remedys	KMT PMS	Diaveridine 3.3%+ S'Quinoxaline 18.7%, 100 gm sachet

### 37.3.3. Furazolidones and combinations

#### Class

Synthetic drugs with broad spectrum of antibacterial and anti-protozoal action.

#### Action

It inhibits the development of nucleic acid in the bacteria and protozoa cells.

#### Indication

Effective in number of intestinal bacterial infection, respiratory infection and intestinal protozoal infection. Furaltadone+Ronidazole combination is indicated for use in treatment of Canker, *E.coli*, Paratyphoid and Coccidiosis in pigeons and cage birds.

#### Dosage

20mg/kg BW

#### Contraindication

Nitrofurans should not be administered in renal dysfunctions, simultaneous administration with nalidixic acid, zoalene (DOT), bromhexine-preparations and carbadox.

Should not be administered in birds producing eggs.

### Precaution

Continuous use of anticoccidial drugs promotes the emergence of drug-resistant strains of coccidia. Various programs are used in attempts to slow or stop selection of resistance. For instance, producers may use one anticoccidial continuously through succeeding flocks, change to alternative anticoccidials every 4–6 months, or change anticoccidials during a single grow out (i.e. a shuttle program).

Brand Name	Manufacturer	MAH	Presentation
Medpet 4 In 1 Powder	Medpet Pvt Ltd	NA	Each 100gm contains Furaltadone 20% + Ronidazole 7%, 100 gm jar
Coccinil Plus	Vetsfarma	NA	Metronidazole I.P. 25mg+Furazolidone I.P. 250mg, 30 gm/500 gm sachet

## 37.4. Ecto-parasiticide drugs

### 37.4.1. Cypermethrin

#### Class

Synthetic pyrethroid, broad spectrum ectoparasiticide

#### Action

They act on the membrane of nerve cells blocking the closure of the ion gates of the sodium channel during re-polarization. This strongly disrupts the transmission of nervous impulses. At low concentrations insects suffer from hyperactivity. At high concentrations they are paralyzed and die.

#### Indication

Effective against tick, louse, lice and other insects

#### Dosage:

Bird - 1ml/L of water

Animal house/shed - 20ml/L of water

## Precaution

Side effects can be potentiated if used simultaneously with organophosphate compound.

Do not administer cypermethrin topically (pour-ons, spraying, spot-on, shampoos, soaps, sprays, etc.) in case of extended **skin lesions**: this can lead to an excessive absorption through the damaged skin.

Cypermethrin, as all synthetic pyrethroids is **extremely toxic to fish and aquatic invertebrates**. For this reason disposal of cypermethrin residues (e.g. in empty containers) in watercourses must be absolutely avoided.

Brand Name	Manufacturer	MAH	Presentation
Clinar	Virbac	Karma PMS	1L Bottle

## 37.5. Mineral and Vitamin supplements

### 37.5.1. Macro Minerals

#### A. Calcium

The main function of calcium in the animal is as a structural component of bone. Other functions include its need in blood coagulation, muscle contraction, myocardial function, and normal neuromuscular irritation.

It is an important component of the intercellular cement which holds cells together. In birds, of course, calcium has the additional function of being the main mineral component of egg shells, which are almost entirely calcium carbonate, 40% of which is calcium.

**Dosage:** Growing bird - 1.2% of the diet

Cage bird - 1% of the diet

Egg laying bird - 1.5-2% of the diet

Turkey - 1.5% of the diet

#### B. Phosphorous

It plays a critical role in cellular metabolism, as a part of the energy currency of the cell, in cellular regulatory mechanisms, and in bone.

**Dosage:** Broiler - 0.4-0.6% of the diet

Turkey - 0.3-0.45% of the diet

Laying bird - 0.4% of the diet



### C. Sodium

Sodium and Chloride are low-cost nutrients with great influence on feed conversion ratio (FCR), eggshell quality, and excreta moisture.

**Dosage:** Layer/broiler - 0.15%

Turkey - 0.13-0.17% of the diet

### D. Potassium

It is required for many body functions which include maintaining water balance, activate enzymes and is required for proper muscle development.

**Dosage:** Layer/broiler - 0.3-0.45% of the diet

Turkey - 0.4-0.7% of the diet

### E. Magnesium

Magnesium has essential functions in cellular metabolism and bone development.

**Dosage:** Layer/broiler - 600 mg

Turkey - 600 mg

## 37.5.2. Micro Minerals

### A. Copper

Copper can contribute to intestinal health in two ways. As an antimicrobial agent, copper can prevent disturbances in the balance of micro flora. It can also help the gut respond to infections, injury and inflammation. Copper is involved in protecting cells from free radical damage as a component of superoxide dismutase and copper enhances iron transport.

**Dosage:** Broiler and layer - 0.15% of the diet

Turkey - 0.12-0.15

### B. Manganese

It activates numerous enzyme systems including those involved with glucose metabolism, energy production and is a major constituent of several metalloenzymes, hormones, and proteins.

**Dosage:** Layer/broiler - 60 mg

Turkey - 60 mg

### **C. Iron**

It is vital for almost all living organisms by participating in a wide variety of metabolic processes, including oxygen transport, DNA synthesis, and electron transport.

**Dosage :** Layer - 50-80 mg  
Broiler - 80 mg

### **D. Selenium**

Selenium is incorporated into proteins to make selenoproteins, which are important antioxidant enzymes. One of the most important of these is an enzyme known as glutathione peroxidase.

**Dosage:** Layer - 0.10-0.15 mg  
Broiler - 0.15 mg  
Turkey - 0.20 mg

### **Precaution**

Mineral deficiencies can produce numerous health problems for chickens including in some cases, death. Thus, to prevent nutritional deficiencies, or when deficiency symptoms are noted, feeding a balanced poultry diet with the required vitamins and minerals should be practiced.

## **37.5.3. Vitamins**

### **A. Vitamin A**

It is important for good eye sight, especially at low light levels (i.e. at night). It is also important in maintaining the integrity of the mucosal cells which are the first defense against invading organisms

**Dosage:** Turkey - 4000 IU  
Poultry - 1500 IU

### **B. Vitamin D**

Aids in the absorption of calcium and, to a lesser degree, phosphorus from the intestinal tract. It is also involved in mobilization of calcium from bones during times of low blood calcium.

**Dosage:** Turkey - 900 IU  
Poultry - 200-500 IU

### C. Vitamin E

Serve as an antioxidant and free radical scavenger.

**Dosage:** Turkey - 12 IU

Poultry - 10 IU

### D. Vitamin K

It is involved in normal blood coagulation.

**Dosage:** Turkey - 1 mg

Poultry - 0.50 mg

### E. Vitamin B-complex

Riboflavin - metabolism of nucleic acids and proteins, and helps in carbohydrate and fat metabolism

**Dosage:** Poultry/Turkey - 3.6 mg

### F. Choline

Required for fat metabolism

**Dosage :** Poultry - 1300 mcg

Turkey - 1500 mcg

Brand Name	Manufacturer	MAH	Presentation
Mintroplex	Provet Pharma	Karma PMS	1000 ml jar
Recovit	Brihans	NA	30/120/1000 bottle
Sel-E-Vera	Brihans	NA	200 gm pouch
Broiler Vita	Medion	NA	100 gm sachet
Aminostress	Medpet	NA	250gm pot
B12 Elixer	Medpet	NA	500 ml bottle
Calfosvet	Vetsfarma	NA	1 & 5 L jar
Selmix	Vetsfarma	NA	100/500 gm sachet

## 37.6. Sedatives and Tranquilizers for Avian Species

### 37.6.1. Diazepam

#### Class

Benzodiazepine sedatives

**Indication**

To control feather picking and seizures, tranquilization

**Dosage**

Most species - 0.5–0.6 mg/kg IM

Most species (Seizure control) - 0.5–1.0 mg/kg BW 8–12 hr IM

Parrots (Sedation) - 2.5–4.05 mg/kg BW 6–8 hr IM

Brand Name	Manufacturer	MAH	Presentation
Dizep	Intas	NA	10 tablet/strip
Calmpose	Ranbaxy	KMT PMS	60 ml vial, 2 ml ampoule

**37.6.2. Ketamine****Class**

Tranquilizer and dissociative anesthetic

**Indication**

Poor muscle relaxation. Often used in combination to reduce violent prolonged recovery

**Dosage**

Raptors (Sedation) - 5–30 Mg/Kg BW IM

Ostriches - 11.1 Mg/Kg BW IM

Waterfowl - 15–30 Mg/Kg BW IM

Parrot, pigeon - 20–50 Mg/Kg BW IM

Brand Name	Manufacturer	MAH	Presentation
Aneket	Neon Labs	KMT PMS	10 ml vial, 2 ml ampoule
Ketmin	Themis	KMT PMS	10 ml vial, 2 ml amp

**37.6.3. Xylazine****Class**

Sedative and preanesthetic drug

**Indication**

Immobilization of excited birds, evoke sedation and muscle relaxation

**Dosage**

Raptors, parrot (heavy sedation) - 1.0–2.2 mg/kg BW IM

Water fowl - 20 mg/kg BW IM

Brand Name	Manufacturer	MAH	Presentation
Xylodac	Zydus AHL	Karma PMS	10 ml vial/2 ml amp
Xylaxin	Indian Immunologicals	Karma PMS	10 ml vial/2 ml amp

**37.7. NSAIDs and Steroids for Poultry Species****37.7.1. Dexamethasone****Class**

Corticosteroid drugs

**Indication**

To reduce the inflammatory response and combat shock

**Dosage**

Most species (Anti-inflammatory) - 0.2–1.0 mg/kg BW once or 12–24 hr for 2–7 days

Shock, trauma - 2–4 mg/kg BW, 12–24 hr

Cranes - 2–8 mg/kg BW, 12–24 hr

Brand Name	Manufacturer	MAH	Presentation
Dexamethasone	Vetindia	Vetline PMS	5 & 10 ml vial
Dexona	Zydus AHL	KMT PMS	5 ml vial

**37.7.2. Meloxicam****Class**

NSIAD drug

**Indication**

Conditions associated with pneumonia, laminitis and other inflammatory conditions

**Dosage**

Most species- 200 µg/kg BW once IM

**Precaution**

Do not use in birds showing hypersensitivity to the drugs and also in conditions like gastroenteritis and hepatic disorders

Brand Name	Manufacturer	MAH	Presentation
Melonex	Intas	Vetline PMS	2 ml amp, 15 & 30 ml vial
Zobid-M	Zydus AH	Karma PMS	15, 30 ml vial

**37.8. Other Miscellaneous Poultry Drugs****37.8.1. Allopurinol****Class**

Xanthine oxidase inhibitor drugs

**Indication**

To treat excess uric acid in blood plasma and its complication and prophylactic treatment of recurrent uric acid uroliths and oxalate uroliths

**Dosage**

Preventive - 20-30mg/kg BW od in divided doses

Treatment - 40-60mg/kg BW od in divided doses

Brand Name	Manufacturer	MAH	Presentation
Goutil	Vetsfarma	NA	100 & 1kg sachet
Nefrotec Vet Liquid	Himalaya	NA	1 L jar

**SECTION C**  
**AQUATIC DRUGS**

## 38. AQUATIC DRUGS

### 38.1. Breeding Inducing Agent

#### 38.1.1. Salmon Gonadotropin Releasing Hormone analogue and Domperidone (Ovaprim)

**Class**

Spawning hormone (Breeding Inducing Hormone)

**Action**

It travels from the injection site through the blood to activation site in the pituitary gland; ovaprim initiates the reproductive cascade and eliminates the need for natural trigger. Domperidone, the other active component of Ovaprim, helps block the inhibitory effect of dopamine. Domperidone therefore is very important for induced spawning of species for which the reproductive cascade would be stopped because of stressors that lead to dopamine release, because dopamine will block GnRH activity.

**Indication**

It is used for artificial induction of spawning in fish.

**Dosage**

Interpretational or intramuscularly @ of 0.5 ml/kg body weight in case of male fish and 0.25 ml/kg body weight in case of female fish.

**Contraindication**

Not to be used in animal/fish intended for use as human consumption or other animals.

**Precaution**

Use in well ventilated area

Avoid self injection

Store at room temperature and protect from direct light

**Composition and Presentation**

Each ml contains Salmon GnRH 20 mcg+Domperidone 10mg, 10ml vial



### 38.1.2. Synthetic Gonadotropin Releasing Hormone (SGnRH) Analogue (WOVA FH)

#### **Class**

Spawning hormone (Breeding inducing hormone)

#### **Indication**

It is used for artificial induction of spawning in fish.

#### **Dosage**

Species	Dose female (ml/kg)	Dose male (ml/kg)
Indian major carps	0.10-0.30	0.30-0.50
Grass carps	0.10-0.30	0.40-0.80
Silver carps	0.10-0.30	0.40-0.80

#### **Precaution**

Store below or at 25° C.

#### **Composition and Presentation**

Synthetic Gonadotropin releasing hormone Analogue, 10ml vial

### 38.1.3. Synthetic Salmon gonadotropin releasing hormone and Domperidone (Ovatide)

#### **Class**

Spawning Hormone (Breeding Inducing Hormone)

#### **Action**

It acts early in the hormonal chain and causes the fish to produce its own gonadotropin. Domperidone, the other active component helps in blocking the inhibitory effect of dopamine.

#### **Indication**

It is used for artificial induction of spawning in fish.

## Dosage

Calculated dosage can be administered intramuscularly in brooder as per the following dosage upon knowing the weight of fish.

Species	Dose Female (ml/kg )	Male (ml/kg)
Catla (Catla catla)	0.40-0.50	0.20-0.30
Rohu	0.20-0.40	0.10-0.20
Mrigal	0.20-0.40	0.10-0.20
Silver Carp	0.40-0.50	0.20-0.25
Grass Carp	0.40-0.50	0.20-0.25

## Precaution

Should not be handled by pregnant women and the fish treated is not advisable for consumption. Store at room temperature and Protect from direct light.

## Composition and Presentation

Each ml contains Synthetic peptide protein Salmon Gonadotropin RH 20 mcg and Domperidone 10mg, 10ml vial.

## 38.2. Fish Anesthetics

### 38.2.1. Benzocaine

#### Class

Fish anesthetic

#### Action

It is inhaled through the gills and rapidly enters the blood. From there they are transported to the central nervous system and excreted via the gills upon the fish's return to fresh water. They work by inducing a calming effect followed by a successive loss of equilibrium, mobility, consciousness and reflex action.

#### Indication

It is used as anesthetics for fish so to reduce handling stress.

#### Dosage

It is not soluble in water and hence standard stock solution should be

prepared by dissolving in acetone or ethanol (100 gm of Benzocaine in 1 litre of acetone/ethanol). This is then used at rate of 1 ml/litre of water as anesthetics.

### **Precaution**

Use in well ventilated area, the powder is respiratory irritant and reasonable care should be exercised. Keep tightly closed, away from bright light. The stock solution is photo liable and should be kept in dark bottle.

### **Composition and Presentation**

Each 100g contains minimum of 99% Benzocaine, 450ml bottle.

## **38.2.2. Phenoxy ethanol**

### **Class**

Anesthetics

### **Action**

It is inhaled through the gills and rapidly enters the blood. From there they are transported to the central nervous system and excreted via the gills upon the fish's return to fresh water.

### **Indication**

It is used as anesthetics for fish so to reduce handling stress especially during breeding and also used to sedate fish during transportation.

### **Dosage**

Take 2-4 ml of 2 phenoxy ethanol and dissolve well in 10 litres of water contained within plastic tub. Transfer the fish to be into the anesthetic solution, the fish will lose its equilibrium within 1-2 minutes.

In case of transportation of fry or fingerling, use 1 ml of 2 phenoxy ethanol for every 5 litres of water contained within durable plastic bag. Transfer the fish in the transportation bag (which contains solution of water and phenoxyethanol) and diffuse oxygen into bag and then seal the bag tightly.

### **Precaution**

It is a mild toxin and may cause some irritation to the skin; therefore, any contact with the eyes should be avoided. Keep tightly closed and away from bright light.

## **Composition and Presentation**

Minimum of 99% 2 phenoxy ethanol, 500ml bottle.

### **38.3. Drugs/Chemicals for Bath and Pond Treatment in Aquaculture**

#### **38.3.1. Acriflavin**

##### **Class**

Bactericides (Bath and dip treatment)

##### **Action**

Acriflavin and other related acridines bind with nucleic acids of the disease causing organism.

##### **Indication**

Acriflavin is effective against external parasitic, treating open wound, fish egg disinfection, bacterial treatment and as well as added in transport water during transportation of fish against bacterial infection.

##### **Dosage**

Make 1-2 ppm of solution in case used in transportation of fish and 10 ppm solution if they are used to treat bacterial and fungal infection in fish.

##### **Contraindication**

It is not indicated for the treatment of fungal infection and for the control of flukes plus not indicted for the breeding fish.

##### **Precaution**

It damages the life plant and it stains, therefore decorations of the tank should be removed before use.

## **Composition and Presentation**

Acriflavin Neutral 100%, 250gm packet.

#### **38.3.2. Chloramine Trihydrate**

##### **Class**

Antiprotozoal

**Action**

As it dissolves, it breaks down rapidly to produce hypochlorous acid (HOCl), which in turn releases chlorine and oxygen. Any chlorine present is liable to have an effect against Fluke and parasite.

**Indication**

Used against Bacterial Gill Disease.

**Dosage**

10, 15 and 20 ppm for 60 minutes in continuous flow or static bath system for three alternative days.

**Precaution**

Avoid skin contact, eye contact, inhalation and ingestion. Keep tightly closed, away from bright light. Temperature between 10°C to 30°C.

**Composition and Presentation**

Minimum assay 99% matter insoluble in absolute ethanol 1.5%, 500gm packet.

### 38.3.3. Methylene Blue

**Class**

Fungicides

**Action**

It is probably due to its binding with cytoplasmic structures within the cells and also its interference with oxidation reduction process.

**Indication**

Methylene Blue is effective against skin and gill flukes, fungus, many external parasite and bacterial infection.

**Dosage**

5mg to 25 litres of water for 2 days.

**Contraindication**

Not indicated to be used in presence of most fresh water plant

**Precaution**

Store at room temperature and keep away from children.

**Composition and Presentation**

Methylene blue ( $\beta$  Dimethylaminol and triphenylethanol in ratio of 13:1), 250mg pkt or 250ml bottle.

**38.3.4. Praziquantel (Prazi-Pro)****Class**

Anthelmintic (Bath/dip)

**Action**

Praziquantel is directly absorbed from the treated water and causes major spasms to the worm, causing them to be paralyzed. The worm is then destroyed in the intestine of the host and is passed through the body of host through their stool.

**Indication**

Provided as bath/tip treatment. Praziquantel treats fish schistosomiasis, liver fluke, gill fluke, skin fluke, flat worm and tape worm.

**Dosage**

2.5mg/L of water

**Contraindication**

It is not indicated to be used in salt water.

**Precaution**

In case of contact with eyes, rinse immediately with plenty of water. Remove carbon before the treatment.

**Composition and Presentation**

Oxybispropanol and more than 5% praziquantel by weight, 470ml jar.

**38.3.5. Formaldehyde****Class**

External parasiticides (Bath treatment)

**Indication**

Effective against protozoans, the parasites of gills, skin and fins.

**Dosage**

15-25mg/L of water

**Contraindication**

It is not effective against internal infection.

**Precaution**

Safety measures should be taken into consideration while handling. Store in the place protected from extreme of cold or heat.

**Presentation**

450ml Bottle

### 38.3.6. Malachite green

**Class**

External parasiticides (Bath or dip treatment)

**Action**

Malachite green binds strongly with the internal cytoplasm structures of parasites and interferes in normal metabolism

**Indication**

Used against all external parasite

**Dosage**

Pond treatment @ 2ppm four times a week is suggested.

For topical application on external wounds, bath in 0.2 ppm malachite green for 10 minutes in case of fungus *Saprolegnia* infection and in 5 ppm malachite green for 5 minutes in case of Branchiomycosis infection.

**Contraindication**

Malachite Green is not indicated for the treatment of bacterial diseases and it is also not recommended to be used in fry and Scaleless fishes.

**Precaution**

Malachite green will persist in the aquatic environment for a long time and

may pass via the food chain so every care must be taken when malachite green used for baths of aquarium or ornamental fish is being disposed.

**Presentation**

25gm packet

**38.3.7. Eco Marine tablet**

**Class**

Probiotics

**Indication**

Eliminates sludge and bad odors, digest organic waste and converts it into macronutrients, controls pH of water and maintain water quality, stabilize plankton bloom, reduces ammonia and other toxic gases.

**Dosage**

40 tablets for one hectare of one meter depth of pond every 15 days

**Presentation**

80 tablets/jar

**38.3.8. V5 powder**

**Indication**

Maintains algal bloom, absorbs toxic gases, improves survival rate, increases dissolved oxygen, maintains water quality and water color and balance pH

**Dosage**

Add 1 kg of V5 in 20 litres of water and activate with aerators for 1-2 hours and then sprinkle in one hectare of pond water. Repeat after every 15 days at different sites.

**Presentation**

1 Kg bag



### 38.3.9. Malefix

**Class**

Bactericides

**Indication**

Treatment of all natural antibacterial infections; treatment heals open wound and wound abrasion, treats tail rot, eye cloud and mouth fungus promotes regrowth of damaged fin rays and tissue.

**Dosage**

5ml/40 litres of aquarium water. Repeat dose daily for 7 days by a 25% water change or until the problem is gone.

**Contraindication**

Not indicated against cure for fish related fungus.

**Precaution**

Water quality parameters should be normal.

**Composition**

1% Melaleuca

## 38.4. Antiseptics/Disinfectants for Aquaculture

### 38.4.1. Copper sulphate

**Class**

Antiseptic/disinfectant

**Indication**

Used against external parasites and phytoplankton bloom control

**Dosage**

Administer @ of 0.4-1 ppm once daily for 5-11 consecutive days to control wide spread of *Ichthyophthirius multifiliis*. Pond treatment @ 0.5 ppm controls phytoplankton bloom. Copper sulphate bath 1:2,000 for 3-4 days in case of tail and fin rot. For control of Saprolegniasis, give short term bath in 20 ppm of copper sulphate.

**Contraindication**

Copper sulphate is not indicated in the low dissolved oxygen ponds.

**Precaution**

Keep tightly closed and away from bright light. Maintain temperature between 10°C to 30°C.

**Composition and Presentation**

Minimum assay 98.5%, Iron 0.08%, Chloride 0.005%, Alkalis 0.5%, 450gm packet.

**38.4.2. Potassium Permanganate****Class**

Antiseptic/Disinfectant

**Action**

It turns the water purple during its effect. It oxidizes organic material, including the surfaces of bacterial sores (ulcers) and the parasites that cause them. Once it spends its energy on the pond and the parasites, it turns amber or brown so should be removed.

**Indication**

Will eliminate anchor worms, fish lice, flukes, cotton mouth, fungus and bacteria. It is also used for prophylactic bath treatment.

**Dosage**

Pond treatment @ 2ppm four times a week is suggested. Topical application on external wounds. As prophylactic bath in 3-5 ppm potassium permanganate for 15 seconds during stocking or shifting fish.

**Precaution**

If possible Bath containing potassium permanganate should be prepared in distilled water.

**Composition and Presentation**

Minimum assay 98.5%, 450gm packet

### 38.4.3. Povidone Iodine

**Class**

Antiseptic

**Indication**

Equipment disinfection and application on open wound

**Dosage**

Full strength

**Composition and Presentation**

Contain 5% povidone iodine, 100ml/500ml bottle.

### 38.5. Fish Antibiotics

#### 38.5.1. Oxytetracycline LA

**Class**

Antibacterial

**Action**

It interferes in the bacteria's ribosome, preventing them from creating proteins.

**Indication**

Fin rot and Dropsy/Kidney bloat.

**Dosage**

Intramuscularly @75mg/kg body weight/day for 10 days

**Precaution**

Remove activated carbon if soluble preparation is to be used.

**Composition and Presentation**

Each ml contains oxytetracycline equivalent to 200mg of anhydrous oxytetracycline, 30ml vial.

**SECTION D**  
**WILDLIFE MEDICINES**

## 39. WILDLIFE MEDICINES

### 39.1. Common Wildlife Anesthetics

#### 39.1.1. Ketamine

##### **Class**

Dissociative anesthetics

##### **Action**

Ketamine hydrochloride is a rapid-acting dissociative anesthetic whose pharmacological action is characterized by profound analgesia, normal pharyngeal-laryngeal reflexes, mild cardiac stimulation and respiratory depression. The anesthetic effect produced does not fit into the conventional classification of anesthetic stages. Instead, ketamine produces a state of unconsciousness that has been termed “dissociative”.

##### **Indication**

For sedation, tranquilization, restraint and as general anesthetic agent. It is used in combination with muscle relaxants or tranquilizers. It is commonly used in conjunction with alpha2 agonist like xylazine and medetomidine in varied wild species.

##### **Drug combination**

It is common to combine two or more drugs to achieve immobilization. This is done to minimize volume, increase potency, achieve a stable safe plane of anesthesia with adequate muscle relaxation and analgesia, improve recovery, and minimize side effects. Combinations of different drugs or varying relative dosages of the same drug combinations may have different effects. Most combinations used in primate anesthesia include a dissociative anesthetic, and many use a reversible sedative, such as an alpha2 agonist or a benzodiazepine, to decrease the required dose of the dissociative drug.

##### **Dosage**

Injectable liquid

**Small mammals:** Ketamine is generally dosed at 3-5mg/kg.

The common cocktails used are;

- ❖ Ketamine/xylazine: mix 2ml of xylazine (100mg/ml) with 10ml of ketamine (100mg/ml) and add 0.25ml of atropine sulphate (15mg/ml). The xylazine portion of mixture is reversed by

yohimbine @ 0.15mg/kg IV.

- ❖ Ketamine/acepromazine: mix 0.5ml acepromazine (10mg/ml) with 10ml ketamine (100mg/ml).

**Reptiles:** 20-40mg/kg for sedation (0.2-0.4 ml ketamil per 100 gram body weight IM).

**Fox, skunk, raccoon:** 3-5mg/kg ketamine with 0.03-0.05mg/kg medetomidine

**Birds:** 5-10mg/kg IM, IV.

**Elephant:** ketamine @ 0.33mg/kg with xylazine @ 0.12mg/kg (100-300mg total dose) IM.

**Himalayan black bear:**

Xylazine+ketamine	2+4mg/kg IM
Medetomidine+ketamine	0.04+1.5mg/kg IM
Medetomidine+zoletil	0.05+2mg/kg IM
Zoletil	7mg/kg IM

**Deer:** 2-3mg/kg in combination with 2 mg/kg xylazine and Atropine sulphate @ 0.02-0.05mg/kg IM, IV, Ketamine 1-2mg/kg with medetomidine 60-90 mcg/kg IM (reverse with atipamezole 3-7 times volume of medetomidine).

**Sambar:** 5mg/kg IM with Xylazine @ 1mg/kg IM plus Atropine sulphate @ 0.02-0.05mg/kg IM

**Chital:** 1.5-2mg/kg with 1-2mg/kg xylazine and atropine sulphate @ 0.02-0.05mg/kg IM.

**Takin:** 0.3ml ketamine (100mg/ml) with 0.6ml xylazine (100mg/ml). Xylazine is reversed by Riverzine @ 5times the dose of xylazine used.

**Nonhuman primates:** ketamine 5-10mg/kg with 0.1mg/kg medetomidine IM, SC, ketamine 5-10mg/kg with xylazine 0.25-3mg/kg IM, SC.

**Rabbit:** ketamine 35-50mg/kg with 0.5mg/kg xylazine IM, SC. Reversal with 0.1-1mg/kg atipamezole.

**Lion:** 3-7mg/kg ketamine with 80-110mcg/kg medetomidine IM

**Fox:** 2.5-3mg/kg ketamine with 50-60mcg/kg medetomidine IM

**Jackals:** ketamine 5-8mg/kg with xylazine 0.5mg/kg IM

**Large felids:** 3.5-6.8mg/kg ketamine with 0.3-1mg/kg xylazine IM or 2.5-4.5mg/kg ketamine with 50-70mcg/kg medetomidine IM

**Hyena:** 4-6 mg/kg ketamine with 1mg/kg xylazine IM

**Monkey:** 5mg/kg ketamine with 50-80mcg/kg medetomidine IM

**Yak:** 2-3mg/kg ketamine with 70-100mcg/kg medetomidine IM.

**Tiger:**

Drug	Dose(mg/kg)	Trade name
Ketamine + medetomidine	Ketamine 3 + 0.07 medetomidine	Ketaset, Vetalar
Ketamine + xylazine	Ketamine 11 + 0.8 xylazine	Ketaset, Ketamil, Vetalar
Zoletil, Telazol	5mg/kg	Zoletil 100

**Contraindication**

Do not use ketamine as sole agents for anaesthesia as it do not possess muscle relaxant activity. It should never be used in animals having hepatic or renal insufficiency.

**Precaution**

Store in cool dark place below 30 degree celcius. As animal's eyes remain open after receiving ketamine, and should be protected from injury plus an ophthalmic lubricant/ointment (chloramphenicol eye ointment, pendistrin SH).

Brand Name	Manufacturer	MAH	Presentation
Ketalar, Ketamil	Troy Laboratories PTY Limited	NA	100mg per ml in 50 ml vial
Ketaset	Zoetis	KMT PMS	100mg/ml
Ketaject	Bayer Healthcare	NA	100mg/ml

**39.1.2. Zoletil****Class**

Dissociative anesthetic-tranquilizer combination

**Action**

Tiletamine is dissociative anesthetic and pharmacologically classified as an NMDA receptor antagonist. It is related to ketamine and phencyclidine. It exists as odorless white crystals and Zolazepam is pyrazolodiazepinone derivative which is related to other benzodiazepine drugs. It is relatively safe in most species, has rapid induction with minimum side effects. Induction time is from few minutes to maximum 10 minutes.

**Indication**

Anesthesia and sedation for transport, radio collaring, examination,

radiography and surgery.

**Dosage**

Injectable after constitution of crystal white powder and 5ml sterile constituent.

Primates: 5-10mg/kg IM

Wild felids: 4-6mg/kg IM

Wild ursides: 3-5mg/kg IM

Wild candies: 8-10mg/kg IM

Deer: 5-9mg/kg IM

Snakes: 15-30 mg/kg IM

Turtle: 3.5-14mg/kg IM

Pigeon: 10-50 mg/kg IM

**Contraindication**

Never use phenothiazine tranquilizer (acepromazine) as premedication. Do not use chloramphenicol pre or post operatively as this will retard the elimination of zoletil. Not to be used in pregnant animals.

It is contraindicated in giraffes and equidae. As no complete antagonist exists therefore recovery can be longer than with other drugs combination that can be completely reversed.

**Precaution**

Store below 25°C. Reconstituted zoletil may be stored at 4 degree for 8 days.

Brand Name	Manufacturer	MAH	Presentation
Zoletil	Virbac	NA	Tiletamine 250mg, zolazepam 250mg. After reconstitution with 5ml sterile water the concentration will be 100mg/ml.

**39.1.3. Captivon 98 - Etorphine hydrochloride**

**Class**

Narcotic anesthetic



## Action

Narcosis with analgesia. It is a potent opiate agonist which produces rapid reversible immobilization at low dose rates as it binds to the multiple opiate sites in the central nervous system. It has a potent effect on depressing the respiratory centers of CNS thus resulting in apnea being commonly seen in immobilized animals. It is routinely combined with azaperone, xylazine, or medetomidine. It is rapidly reversed with naltrexone or diprenorphine (3-5 times the dose of etorphine in elephant, rhino, giraffe and 2-3 times in others). It is chemically related to morphine.

## Indication

Sedation and anaesthesia for immobilization, radio collaring, transport and treatment of ungulates, elephant, gaur and other wild species.

## Dosage (Injectable clear colorless liquid)

*Equidae*: 0.44mg per 100 lbs

*Ursidae*: 0.50 mg per 100 lbs

*Cervidae*: 0.98 mg per 100 lbs

*Bovidae*: 0.09 mg per 100 lbs

*Elephant*: 0.003mg/kg. Antagonize with 0.012mg/kg diprenorphine. 1mg/1000kg IM; 6-7mg total etorphine is sufficient to immobilize an Asian elephant.

*Deer*: 0.5-0.75ml/100kg IM.

*Tiger*: 1mg/100 lbs.

*Antelope*: 4.2-6mg total IM.

Antagonist trexonil should be administered 3-5times the dose of etorphine in elephant, rhino, gaur, etc. 2-3 times the dose of etorphine in other animals.

## Contraindication

Do not use unless antidote or antagonist is on hand. Accidental human exposure is quite dangerous. Do not use in domestic animals. Do not use in old, diseased, emaciated and highly stressed animals.

## Precaution

Be careful with felidae as they show severe adverse reaction. Diprenorphine should never be used to antagonize etorphine in humans, use either naloxone (narcane) or naltrexone. Wear protective gloves and eye protection. Keep antidote (trexonil) ready which shall be given intravenous

quickly. Store below 25 degree and protect from light. Stimulant drug should be available. Inject doxapram 2-3ml/100kg.

Brand Name	Manufacturer	MAH	Presentation
Captivon 98	Wildlife pharmaceutical Pvt Ltd	NA	9.8mg/ml in 10ml vial

*\*The antagonist naltrexone (Trexonil®) is supplied separately.*

### 39.1.4. Zylaxine hydrochloride

#### **Class**

Alpha2 adrenergic agonist

#### **Indication**

Tranquilization and sedation

#### **Action**

Alpha2 agonist with sedative, analgesic and muscle relaxant property. Its sedative and analgesic activity is related to central nervous system depression. It is commonly used in combination with ketamine. Yohimbine hydrochloride at dose 0.2-0.3 mg/kg administered intravenously can reverse its effect. It can also be reversed by tolazoline and atipamezole.

#### **Dosage**

Injectable liquid

**Deer:** 2-3mg/kg

**Canides:** 0.6-2mg/g im, iv

Rodents: 4-8mg/kg

**Bovidae:** 0.05-0.3mg/ml

**Gaur:** xylazine 0.12-0.22mg/kg + acepromazine 0.04-0.09 mg/kg + Etorphine 0.010-0.22mg/kg IM. Reversal with diprenorphine 0.020-0.044mg/kg.

**Yak:** xylazine 0.05-0.2mg/kg + acepromazine 0.025-0.10mg/kg + etorphine 0.006-0.024mg/kg IM. Reversal with diprenorphine 0.012-0.024mg/kg IM

**Antelope:** 0.17mg/kg xylazine with 0.017-0.018 carfentanil IM.

**Elephant:** 100mg xylazine/metric ton with 0.04-0.06mg/kg acepromazine or 0.12mg/kg xylazine (100-300mg total dose) with 0.33mg/kg ketamine IM.

## Contraindication

Bradycardia, ruminal stasis and occasionally bloat.

## Precaution

Never use alone for sedation.

There is depressed respiration.

Do not use xylazine in conjunction with tranquilizers.

Provide adequate ventilation.

Always use atropine sulphate when using xylazine.

Brand Name	Manufacturer	MAH	Presentation
Ilium-xylazil-100	Troy Lab Pvt Ltd	NA	100mg/ml
Anased	Akorn Animal Health	NA	100mg/ml
Rompun	Bayer	NA	100mg/ml

### 39.1.5. Medetomidine/Zalopine

#### Class

Alpha2 agonist

#### Action

Provides moderate analgesia and sedation. It is used in combination with dissociative agent like ketamine. It has less cardiopulmonary depression than xylazine. It is reversed by injecting 4-5times dose of medetomidine.

#### Indication

Tranquilization and sedation

#### Dosage

**Canides:** 0.04mg/kg IM

**Rabbits:** 0.2mg/kg IM

**Birds:** 0.1mg/kg IM

**Small ruminants:** 50-100mcg/kg IM, IV with ketamine 2-4mg/kg IM.

**Deer:** 60-90 mcg/kg medetomidine with 1.5-2mg/kg ketamine IM.

**Reptiles** (snake, tortoise): 0.1mg/kg with 5-10mg/kg ketamine IM. Reversal by injecting 0.5mg/kg atipamezole IM.

#### Contraindication

Cardiac diseases, respiratory disorders, renal and hepatic disease, shock and severe debilitation.

## Precaution

Not to be given in very young and very old animals. Should not be used alone for sedation. Always use atropine sulphate when using such drugs. Atipamezole is used for reversal about 3-5 times the dose of medetomidine should be used.

## Composition/Presentation

10mg/ml

### 39.1.6. Acepromazine/Acetylpromazine

## Class

Phenothiazine derivative

## Action

Tranquilizer and central nervous system depressant which has anti-emetic effect. Mode of action is by blockade of dopamine nerve receptors in brain. It provides muscle relaxation and provides prompt and pronounced calming effect.

## Indication

Tranquilization/Pre-medication and control of vomiting and nausea. It is used in combination with ketamine. Usually 0.5ml acepromazine is added with 10ml of ketamine.

## Dosage

Injectable liquid.

**Canides:** 0.25-0.5mg/lb IM or SC

**Felides:** 0.5-1mg/lb IM or SC

**Rabbit:** 0.05-0.2mg/kg IM

**Rodents:** 1-2mg/kg IM

**Primates:** 0.1-0.5 mg/kg SC, IM, IV

**Mice, Rats, Hamsters, Guinea pigs, Chinchillas:** 0.5 mg/kg IM

In *other species* the recommended dose is 0.25 to 1mg per pound body weight.

## Contraindication

Low blood pressure, renal and hepatic insufficiency.

It potentiates the toxicity of organophosphate; therefore, it should not be used to control tremors associated with organic phosphate poisoning.

## Precaution

Keep at room temperature in tightly sealed container.

Brand name	Manufacturer	MAH	Presentation
Acepromazine maleate, Ace, ACP	Bayer animal health	NA	10mg/ml, 50ml vial

### 39.1.7. Diazepam/Valium

#### Class

Benzodiadepine derivative

#### Action

The subcortical levels (primarily limbic, thalamic, and hypothalamic), of the CNS are depressed by diazepam and other benzodiazepines thus producing the anxiolytic, sedative, skeletal muscle relaxant, and anticonvulsant effects seen. The exact mechanism of action is unknown, but postulated mechanisms include: antagonism of serotonin, increased release of and/or facilitation of gamma aminobutyric acid (GABA) activity, and diminished release or turnover of acetylcholine in the CNS.

#### Indication

Mild sedation and as pre-anesthetics

#### Dosage

Injectable liquid

**Dose for all species:** 0.25-0.5 mg/kg IM or IV up to 2.5-5mg/kg in rabbit.

**Ferrets:** For premedication/sedation: 1 – 2 mg/kg IM; may be given with ketamine@10 – 20 mg/kg. (Morrisey and Carpenter 2004).

**Rabbits/Rodents/Small Mammals:** 1 – 5 mg/kg IM)

**Birds:** 0.5 – 2 mg/kg IV or IM.

**Deer:** 0.5-1mg/kg IM, IV

#### Contraindication

Hypersensitivity to benzodiazepines, significant liver disease

#### Precaution

Hepatic or renal disease, aggressive, debilitated or geriatric patients; patients in coma, shock or with significant respiratory depression.

Never give diazepam in shock.

Brand Name	Manufacturer	MAH	Presentation
Lori	Neon Laboratories	KMT PMS	5 mg/ml, 2 ml Ampoule

### 39.2. Common Antagonist Drugs used as Reversal Agents in Wildlife

Name	Action	Dosage	Trade Name	Prese n- tation
Diprenorphine Naltrexone Naloxone	Reversal of captivon 98 and other opioids	5 times dose of etorphine. Narcan dose is 0.015-0.04mg/kg IV, IM	M5050 Trexonil Narcan	50mg/ ml
Atipamizole, yohimbine, tolazoline	Antagonizes agonists such as medetomidine or xylazine	3-5 times that of domitor or xylazine or Yohimbine 0.1-0.15mg/kg IV, IM	Antisedan	100mg /ml
Reverzine	Reversal of Xylazine	5times dose of a2 agonist used.	Reverzine	100mg /ml

### 39.3. Other Accessory Drugs in Wildlife

#### 39.3.1. Epinephrine/Adrenaline

Alpha & Beta-Adrenergic Agonist used systemically for treating anaphylaxis & cardiac resuscitation. (Make 1:10,000 solution for IV or intratracheal use, dilute each mL with 9 mL of normal saline for injection) or 0.1mg/kg IV or IM in all species. It is also used as local hemostat.

#### 39.3.2. Atropine Sulphate

Used for a variety of indications like bradycardia, premedication for control of respiratory secretion, antidote, etc. general dose for all species is 0.01-0.05 SC, IM or IV.

#### 39.3.3. Doxapram

CNS/respiratory stimulant. It stimulates respiration during and after general anesthesia and/or to speed awakening and reflexes after anesthesia. General dose for most animal species is 1-2mg/kg IV, 5-10 mg/kg for birds and

5mg/kg for reptiles or general dose is 2-3ml/100 kg body weight. (Doxapram HCl for Injection: 20 mg/mL; 20 mL multi-dose vial).

#### **39.3.4. Enalapril maleate**

Used primarily as a vasodilator in the treatment of heart failure or hypertension. General dose rate is 0.25 – 0.5 mg/kg (roughly).

#### **39.3.5. Fentanyl Citrate**

Class-II opiate analgesic (synthetic opoid) used parenterally & transdermally in small animals. It is less potent than carfentanil. It is useful for the adjunctive control of postoperative pain and in the control of severe pain associated with chronic pain, dull pain, and non-specific, widespread pain (e.g., associated with cancer, pancreatitis, aortic thromboemboli, peritonitis, etc.). Fentanyl citrate injectable formulation 20mg/ml in 20ml vial. Reversal by naltrexone 3times the fentanyl dose.

#### **39.3.6. Carfentanil Citrate/Wildnil**

Aqueous solution 3mg/ml is available. It is used exceptionally for rapid immobilization with dose volume as low as 1ml or less in free-ranging and captive cervidae. It is reversed by naltrexone HCL at dose rate of 100 mg of naltrexone for each mg of carfentanil. It has morphine like action but it is 10,000 times more potent than morphine. Dose for cervidae (deer, elk) is 0.005-0.020 mg/kg deep IM. Immobilization is usually achieved within 2-10 minutes. (*Caution: Extremely potent drug, need to be careful. Do not use unless antidote is no hand*)

#### **39.3.7. Frusemide/Lasix**

A loop diuretic commonly used in many species for treatment of congestive cardiomyopathy, pulmonary edema, udder edema, hypercalcuric nephropathy, uremia, as adjunctive therapy in hyperkalemia &, occasionally, as an antihypertensive agent. Furosemide is contraindicated in patients with anuria or who are hypersensitive to the drug. General dose for all species is 0.5-2mg/kg IV or IM.

#### **39.3.8. Chlorphenamine maleate**

An alkylamine antihistamine used primarily for its antihistamine/antipruritic effects; occasionally used for CNS depressant (sedative) effects. Dose is 0.3-0.5 mg/kg IM for most animals.

### **39.3.9. Diphenhydramine HCl**

Antihistamine used primarily for its antihistaminic effects, but with various indications (prevention of motion sickness, sedative, antiemetic, etc.)

### **39.3.10. Prednisolone acetate**

Corticosteroid commonly used to lower pain and inflammation of wild animals. Generally 0.5-1mg/kg IM dose is used for most animals in tapering manner for 3-5days.

### **39.3.11. Dexamethasone**

Steroid used in emergency case like shock, circulatory collapse and burns. General dose is 10-30mg (total dose) for all animals. Deer @ 5mg/kg IV.

### **39.3.12. Lignocaine HCL/Lidocaine 2%**

Local anesthetic used for local infiltration for suturing of minor wounds in wild animals.

### **39.3.13. Ethamsylate/Botrophase**

Hemostatic agent. It used to control bleeding in injured animals.

### **39.3.14. Neuroxin**

Nervine tonic drug. It is commonly used for neurological disorders, debility, exhaustion, anorexia and as supportive therapy along with antimicrobials. Dose ranges from 2-10 ml depending upon size of animal.

### **39.3.15. Belamyl/Vitamin B complex**

Used for anorexia, general weakness, anemia and also for growth and development. Dose is 0.2-2ml IM, SC up to 10ml in large animals.

### **39.3.16. Butorphanol Tartrate**

Partial opiate agonist/antagonist used in a variety of species as an analgesic, premedication, antitussive and antiemetic.

Ferrets: Butorphanol alone 0.05 – 0.1 mg/kg IM, SC. Or Butorphanol/Xylazine: Butorphanol 0.2 mg/kg + Xylazine 2 mg/kg IM

Rabbits/Rodents/Small Mammals (restraint): 0.1 – 0.5 mg/kg IV (Ivey and Morrisey 2000)

Birds: 1 – 2 mg/kg IM (Lichtenberger 2006a)

Reptiles/Amphibians (analgesic): 0.05 – 1 mg/kg q12h IM, IV, PO, SC up to 20 mg/kg in tortoise (Bays 2006).



### 39.3.17. Azaperone tartrate/Stresnil

Azaperone is indicated for the control of aggressiveness and as a preoperative agent prior to general anesthesia. 1-2 mg/ kg deep IM for most animals.

### 39.3.18. Fluids

Normal saline, Sodium bicarbonate, DNS, RL and Mannitol.

## 39.4. Veterinary Drugs commonly used in Wildlife

Category of Drugs	Type of Drugs	Species	Dosage (mg/kg)
Antibiotics	Amoxicillin	Small mammals Birds	12.5-20 IM, IV q12h 125-150 IM, IV q12h
Antibiotics	Amikacin	Reptiles Most Animals Reptiles Birds	5-6 IM 2-5 IM q24h 25 IM q24-48 20 IM q12h
Antibiotics	Gentamicin	Mammals Birds Reptiles	2-3 IM, IV 5 IM BID x 3days 2.5mg/kg IM q72h
Antibiotics	Cephalexin	Small mammals Birds	15-20 IM q12h 35-100 IM q6-8h
Antibiotics	Cefotaxime	Birds Reptiles	50-100 IM 20-40mg/kg IM q24h
Antibiotics	Chloramphenicol	Small mammals Birds Reptiles As ophthalmic	25-50 IM 50 IM 40-50 IM 1 drop for 4-8hrs
Antibiotics	Ciprofloxacin	Small mammals Birds Birds Reptiles	5-20 IM q12h 5-10 IM q24h 5-20 IV,IM q12h 5-10 IM q24h
Antibiotics	Enrofloxacin	Small mammals Birds Reptiles Deer (dog bite)	10 IM q12h 10-15 IM q12h 5-10 IMq24-48h 5 SC x 3days
Antibiotics	Metronidazole	Primates Birds Reptiles	12.5-25 PO X 5days 50-60 PO 125-250 PO X 5days

Antibiotics	Oxytetracycline LA	Primates Deer (wound)	10 IM 20 IM single dose
Antibiotics	Benzathine penicillin	Primates	20,000-60,000 IM
Antibiotics	Tylosin	Most species	10-20 IM
Antibiotics	Trimethoprim + Sulfa	Deer	20 IM
Antibiotics	Amoxicillin + Ampicillin	Most mammals Birds Reptiles	11-22 BID 150-200 BID 6 SID
Anthelmintics	Albendazole	Primates	10 PO q12h X 5days
Anthelmintics	Levamisole	Primates	4-5 PO q 24h X 6days
Anthelmintics	Ivermectin	Most animals Deer	0.2 SC, repeat in 10- 14days 0.2 SC single dose
NSAIDs	Ketoprofen	Small animals Birds	2 IM q24 x 3days 1-5 IM
NSAIDs	Meloxicam	Small mammals Birds Reptiles	0.3-0.6 IM 0.5-1 IM 0.2 IM
NSAIDs	Flunixin meglumine	Most species Deer Rodents	0.3-1 IM, IV x 3days 2 IV SID x 3days 2-2.5 IM
NSAIDs	Phenylbutazone	Most species	1-5 PO, IV SID
Anti-histaminics	Cimetidine	Monogastric animals Small mammals	5-10 IM, PO TID 2.5-5 IM, IV, PO TID

# **SECTION E**

## **VACCINES AND BIOLOGICALS**

**\*\*Details on vaccination schedule in livestock and poultry for locally produced vaccines/imported vaccines can be referred from Annual RNR Extension Manual produced by ICS, MoAF**

## 40. VACCINES AND BIOLOGICALS

### 40.1. Anthrax Spore Live vaccine

#### Dosage Form

Injectable Liquid

#### Description

The vaccine is locally produced suspension of living spores of an encapsulated avirulent strain of *Bacillus anthracis* (Stain) in 50% glycerine saline.

#### Indication

For immunization of cattle, buffalo, pigs, sheep and goat against anthrax disease

#### Composition

Each dose of vaccine (1ml) contains not less than 10 million of encapsulated avirulent *Bacillus anthracis* spores, strain 34F<sub>2</sub> Weybridge suspended in physiological saline and glycerine.

#### Vaccination regimen

Primary vaccination is given at the age of 3-4 months during the month of March/April. Vaccination is not required in a particular area if there has not been outbreak for three years after the last outbreak.

#### Dosage & administration

Cattle & Buffalo 1 ml SC

Pig, Sheep & Goat 0.5 ml SC

#### Presentation

25 & 50 ml

#### Storage

Store between 2<sup>o</sup> – 8<sup>o</sup> C. Do not freeze.

#### Precautions

Since the vaccine contains the live spores, persons with abraded hands should not handle the vaccine. After vaccination, the syringes and the

needles should be thoroughly sterilized in boiling water for 1 hour.

***The vaccine should not be used during an outbreak.***

## **40.2. Hemorrhagic septicemia and Black quarter combined vaccine (HS+BQ)**

### **Dosage Form**

Injectable liquid form

### **Description**

Contains formaldehyde inactivated cultures of *Pasteurella multocida* and *Clostridium chauvoei* adsorbed on aluminum hydroxide gel

### **Indication**

Recommended for prophylactic vaccination against HS and BQ in cows and buffaloes.

### **Vaccination regimen**

Primary vaccination – Six months of age and above

Revaccination - To be done annually. Revaccination is recommended in case of adverse climatic conditions like unseasonal rains, cyclones etc since it can also cause stress in animals.

### **Dosage & administration**

Cattle, buffalo & calf - 3 ml SC in mid-neck region.

### **Presentation**

Available in polypropylene vials of 90 ml (30 doses)

### **Storage**

Store between 2<sup>o</sup> – 8<sup>o</sup> C. Antigenicity of the vaccine deteriorates if the temperature is allowed to fluctuate beyond this range.

At no stage should the vaccine be allowed to freeze.

### **Precautions**

Generally no adverse reactions are noticed. A slight swelling may appear at the site of inoculation which disappears quickly.

In rare cases hypersensitivity may occur, immediate treatment with antihistaminics is advocated.

### 40.3. Classical Swine Fever vaccine

#### **Dosage Form**

Injectable Freeze dried form

#### **Description**

The vaccine is prepared by suspension of spleen and lymph nodes from experimentally infected rabbits after attaining high level of viraemic fever.

#### **Indication**

For active immunization of pigs against Classical swine fever disease.

#### **Composition**

It contains attenuated Lapinised strain of Classical swine fever virus in freeze dried form.

#### **Vaccination regimen**

Primary vaccination is given at 45-60 days of age. Subsequent vaccination is to be done annually

#### **Dosage & administration**

1 ml of reconstituted vaccine SC

#### **Presentation**

10 doses vial. Diluents are supplied separately.

#### **Storage**

Store at  $-20^{\circ}$  C. Transport between  $2^{\circ}$  –  $8^{\circ}$ C.

#### **Precautions**

After vaccination the animals should be observed for about an hour for any hypersensitivity reaction.

*If hypersensitivity occurs, immediate treatment with antihistaminic is advocated.*

### 40.4. *E. coli* oral vaccine

#### **Dosage Form**

Oral liquid form

**Description**

It is a culture of different strains of *E. coli* growth in a suitable medium.

**Indication**

The vaccine is used for protection of susceptible pigs against *E. coli* infection.

**Vaccination regimen**

One vial broth culture vaccine is mixed with 1.5 kg of feed and fed per sow.

The vaccine should be given for 3 consecutive days starting from 75 days of gestation.

**Storage**

Store between 2° – 8° C. Do not freeze.

**40.5. Foot and Mouth Disease vaccine (FMD Oil)****Dosage Form**

Injectable liquid

**Description**

Contains inactivated tissue culture FMD strains O, A, and Asia-1 adjuvant with mineral oil and inactivated with aziridine compound.

**Indication**

For active immunization of cattle, buffalo, pigs, sheep and goat against Foot and Mouth disease

**Vaccination regimen**

Ruminants:

Primary vaccination: 4 months of age and onwards

First revaccination (booster): 9 months after primary vaccination

Subsequent vaccination is to be done annually

**Dosage & administration**

Cattle & Buffalo: 2 ml deep IM

Pig, Sheep & Goat: 1 ml deep IM

**Presentation**

Available in polypropylene vials of 100 ml

**Storage**

Store between 2<sup>0</sup> – 8<sup>0</sup> C. At no stage should the vaccine be allowed to freeze.

**Precautions**

Injection with mineral oil into humans can produce serous localized reactions and care should be taken to avoid accidental inoculation. The vaccine should not be used during an outbreak.

### 40.6. Rabies vaccine

**Dosage Form**

Injectable liquid

**Description**

Rabigen vaccine is prepared from fixed Rabies vaccinal strain Pasteur VP12 grown in Baby Hamster Kidney cell line and inactivated with beta-propiolactone.

**Indication**

Active immunization of Dogs, Cats, Cattle and Horses, and in principle all mammals against Rabies.

**Composition**

Contain inactivated VP12 Rabies strain and adjuvant with 10% v/v Aluminium hydroxide gel.

**Vaccination regimen**

*Carnivores* – a single injection from 3 months of age, *Herbivores* – a single injection from 6 months of age.

Primary vaccination can be administered at an early age, but a repeat injection must be given at 3 or 6 months of age depending of the species. Annual vaccination is recommended.

**Dosage & administration**

1 ml SC or IM



**Presentation**

10 ml vial

**Storage**

Store between 2<sup>o</sup> – 8<sup>o</sup> C. Do not freeze.

**Precautions**

Only healthy and de-wormed animals should be vaccinated.

**40.7. Raksharab vaccine****Dosage Form**

Injectable liquid

**Description**

Raksharab vaccine contains tissue culture Rabies virus, CVS (Challenge Virus Standard) strain, produced in BHK (Baby Hamster Kidney ) 21 cell line and inactivated with aziridine compound

**Indication**

The vaccine is intended for immunization of dogs and other domestic animals against Rabies for prophylaxis and post bite therapy.

**Composition**

Each dose contains inactivated “CVS” Rabies viral antigen with a potency  $\geq$  -2.5 IU per dose with Aluminium hydroxide gel as adjuvant. Thiomersal 0.01% w/v added as preservative.

**Vaccination regimen**

For vaccination of animals of 3 months. If primary vaccination is given below three months of age, a booster dose is recommended in the 3<sup>rd</sup> month. Annual booster dose is recommended in endemic areas.

**Dosage & administration**

1 ml SC or IM

**Presentation**

10 ml vial

**Storage**

Store between 2<sup>o</sup> – 8<sup>o</sup> C. Avoid freezing.

**Immunity**

The immunity is for a period of three years.

**Precautions**

Vaccinate only healthy animals.

**40.8. Fowl pox vaccine****Dosage Form**

Injectable Freeze dried

**Description**

This vaccine contains Fowl pox vaccine virus strain received from Tri Bio Laboratories; USA. The virus is grown in cell culture derived from Specific Pathogen Free (SPF) eggs, harvested and freeze dried with suitable stabilizer.

**Indications**

It is recommended for active immunization of chicks in production at farm level.

**Vaccination regimen**

Vaccination is recommended at 8<sup>th</sup> and 16-18<sup>th</sup> weeks age birds.

**Dosage & administration**

Wing web method 0.02 ml per chick

Intramuscular route 0.2 ml per chick

For route of administration please refer the leaflet that comes along with the vaccine. In case of re-current Fowl pox problematic flocks, vaccination by intramuscular method is preferred.

**Presentation**

1000 doses vial

**Storage**

Store between 2<sup>o</sup> – 8<sup>o</sup> C preferably in the deep freeze and transport through cold chain system.

## 40.9. Marek's disease vaccine

### Dosage Form

Injectable freeze dried

### Description

This vaccine contains live Marek's disease vaccine (MD) virus (HVT FC-126) strain of Turkey Herpes virus cell associated in frozen form received from Tri Bio Laboratories; USA. The vaccine virus is produced in chick embryo cell culture derived from Specific Pathogen Free (SPF) eggs, harvested and freeze dried with suitable stabilizer.

### Indication

This vaccine is recommended for active immunization of chicks in production at hatchery level against Marek's disease.

### Vaccination regimen

Vaccination is done at day old age by subcutaneous route in the lower neck region. In case of disease outbreaks at late stages, the chicks should be boosted with 0.2 ml dose at 12-14 days of age.

### Dosage and administration

0.2 ml S/C

### Presentation

1000 doses vial

### Storage

Store between 2<sup>0</sup> – 8<sup>0</sup> C preferably in the deep freeze and transport through cold chain system.

### Reconstitution

Store the diluents in the refrigerator overnight, to chill before use. Allow the pellet to dissolve completely with diluents. Reconstituted vaccine should be stored on ice and used completely within one hour.

## 40.10. Infectious Bursal Disease (Gumboro) Disease vaccine

### Dosage Form

In freeze dried pellet - Eye drop/Drinking water method

## Description

This vaccine contains Infectious Bursal (Gumboro) Disease vaccine virus Intermediate Type Strain received from Tri Bio Laboratories; USA in lyophilized form .The virus is produced in chick embryo cell culture derived from Specific Pathogen Free (SPF) eggs, harvested and freeze dried with suitable stabilizer.

## Indication

This vaccine is recommended for active immunization of chicks in production at farm level against IBD against infections.

## Dosage & administration

*Eye drop method:* 0.03ml per chick

Eye drop method should be used for primary vaccination. Instill one drop into the eye per chick. Use reconstituted vaccine immediately.

*Drinking water method:* sufficient vaccine mixed with water for birds to be vaccinated.

Litres of water to be added:

Age of birds	200 doses
14-18 days	2-3 litres
21-28 days	3-4 litres

## Drinking water method

For drinking water method, before giving the vaccine, withhold the birds from drinking water for at least two hours to allow birds to get thirsty. Do not use chlorinated water. Vaccination should always be conducted during cool hours.

## Presentation

200 doses

## Storage

Store the vaccine between 2<sup>o</sup> – 8<sup>o</sup> C preferably in the deep freeze and transport through cold chain system. Diluents must be stored and transported at room temperature.

## Reconstitution

Store the diluents in the refrigerator overnight, to chill before use. Allow

the pellet to dissolve completely with diluents. Reconstituted vaccine should be stored on ice and used completely within one hour.

#### **40.11. Newcastle Disease vaccine Lentogenic B1**

##### **Dosage Form**

Injectable Live & freeze dried form

##### **Description**

This vaccine contains Newcastle disease Lentogenic B1 strain received from Tri Bio Laboratories, USA and the virus is grown in Specific Pathogen Free (SPF) eggs, harvested and freeze dried with suitable stabilizer.

##### **Indications**

It is recommended for active immunization of different age group chicks and layer flock in production against field strains of Newcastle disease virus and this vaccine is more suitable for priming of young chicks during their first week of life.

##### **Vaccination regimen**

This vaccine is recommended for young chicks between 1-6 days of age

##### **Dosage & administration**

Nasal instillation/eye drop method: 0.03 ml per chick

##### **Presentation**

200 doses vial

##### **Storage**

Store between 2<sup>o</sup> – 8<sup>o</sup> C preferably in the deep freeze and transport through cold chain system.

##### **Reconstitution**

Store the diluents in the refrigerator overnight, to chill before use. Allow the pellet to dissolve completely with diluents. Reconstituted vaccine should be stored on ice and used completely within one hour.

## 40.12. Newcastle Disease vaccine Mesogenic (R2B/Mukteswar)

### Dosage Form

Live & freeze dried form, Injectable

### Description

This vaccine contains Newcastle disease Mesogenic virus strain received from IVRI, Izatnagar, U.P. in lyophilized form and the virus is grown in Specific Pathogen Free (SPF) eggs, harvested and freeze dried with suitable stabilizer.

### Indications

It is recommended for active immunization of birds and layer flock in production against field strains of Newcastle disease viruses.

### Vaccination regimen

Vaccination is recommended for birds at the age of 8-9 weeks & 16-18 weeks

### Dosage & administration

Intramuscular / subcutaneous route: 0.5 ml per chick

### Presentation

100 & 200 doses vial

### Storage

Store between 2<sup>o</sup> – 8<sup>o</sup> C preferably in the deep freeze and transport through cold chain system.

### Reconstitution

Store the diluents in the refrigerator overnight, to chill before use. Allow the pellet to dissolve completely with diluents. Reconstituted vaccine should be stored on ice and used immediately.

## 40.13. Peste des petits ruminants (PPR) vaccine

### Dosage Form

The vaccine is presented as freeze dried preparation in vials with three different dose pack of 25 doses, 50 doses and 100 doses.

**Description**

It is a live; vero cell culture based viral vaccine. It has been lyophilized (freeze-dried in vials) and sealed under vacuum to preserve stability.

**Indications**

Recommended for vaccination against Peste des petits ruminants (PPR).

**Vaccination regimen**

Vaccine is recommended for use in goats above 4 months age. Annual vaccination shall be carried out to cover new young flocks. Animals that received vaccination in the previous year shall not be revaccinated.

**Dosage & administration**

Inject 1 ml of reconstituted vaccine per animal with subcutaneous injection at mid neck region.

**Presentation**

25 doses, 50 doses and 100 doses.

**Storage:**

Store between 2 to 8°C. Protect from direct sunlight. Diluents may be stored at room temperature

**Reconstitution**

The freeze dried vaccine vial is reconstituted along with the respective dose pack diluents bottles provided. Mixing is carried out by drawing small quantities of diluents from respective diluents bottles in the sterile syringe and then injecting this diluents in a freeze dried vaccine vial. Shake the vial well and allow rehydrating the freeze dried pellet and then drawing rehydrated vaccine and transferring it to the diluents bottle. Rinse the vaccine vials 2 times with the diluents in a similar manner. Reconstituted vaccine should be used immediately.

**Precautions**

Weak, debilitated and infested animals should not be vaccinated.

Vaccination should not be taken up in the areas of disease outbreak.

Check for cold chain before reconstitution and vaccination.

Not recommended in animals at advanced stage of pregnancy.

Part use of reconstituted vaccine vial and storing for later is not recommended.

**SECTION F**

**CHEMICAL DRUG FORMULATIONS**



## 41. CHEMICAL DRUG FORMULATIONS

### 41.1 Antiseptics

Boric acid	1-2%
Hydrogen peroxide	1:5 to 1:10
Potassium permanganate	1:1000 to 1: 5000

### 41.2 Mouth Washes

Alum	1%
Boric acid	2-3%
Copper sulphate	0.5%
Potassium permanganate	1:2000
Sulphanilamide	1%
Collutoria (mouthwash)	
Tannic acid	30g
Glycerine	150ml

Mix well and smear in buccal mucosa.

### 41.3 Skin antiseptics (antipruritic)

Magnesium sulphate	2-4%
Sodium carbonate	2-5%

### 41.4 Disinfectants

Alcohol	70%
Formalin	5%
Sodium carbonate	4%
Sodium Hypochlorite	4%
Tincture iodine	5-7%

### 41.5 Antiseptic Ointments

#### a. Whitfield ointment

<i>A. Benzoic acid</i>	6 parts
Salicylic acid	3 parts
Paraffin jelly	100 parts

For external application for fungal infections. Apply topically to the affected area daily.

*b. Boric acid ointment:*

Boric acid	10gm
Paraffin	90gm

*c. Zinc oxide ointment*

Zinc oxide	15gm
Paraffin	85g

*d. Sulphur ointment*

Sulphur sublimate	10g
Paraffin	90g

For treatment of mange. Apply topically to the affected area daily

*e. Salicylic ointment*

Salicylic acid	20g
Paraffin jelly	980g

Used in treatment of wounds.

#### **41.6 Lotion**

*a. Boric acid eye lotion*

Boric acid	2gm
Distil water	98ml

*b. Salicylic lotion*

Salicylic acid	2g
Tannic acid	2g
Spirit	30ml

#### **41.7 Urinary antiseptics**

Hexamine	4-8gm
Sodium acid Phosphate	30g

#### **41.8 Universal Antidote**

Activated charcoal	50gm
Magnesium oxide Levis	25g
Kaolin	25g
Tannic acid	25g

Divide into 5 parts and given in a day by stomach tubes.

## 41.9 Haematinics

Haematinic: Drugs or agents which increases the number of red blood cellular haemoglobin content in the blood.

General

Cattle

Ferri Sulph	-	50g
Copper Sulph	-	20g
Cobalt sulph/chloride	-	2g
Calcium Lactate	-	150g

Mft pulv Sig 1/10 daily orally (indicate divide the above drug into 10 equal parts and give each part daily).

a. Formula I

Ferric Sulphate	5g
Cupric Sulphate	500g
Cobalt sulphate	100g

Mix and make 20 such packets, administer 1 dose orally twice for 10 days (use water to drench).

b. Formula II

Ferric Sulphate	40g
Cupric Sulphate	10g
Calcium Lactate	100g
Cobalt Sulphate	200g

Mix and make 10 equal parts administer 1 dose daily for 10 days as drench.

## 41.10 Stomachic

Stomachic: Drugs which increases the secretion of gastric juice.

Cattle

Sodium Bicarbonate	15g
Sodium Chloride	15g

Prepare 12 packets of such powder and give one packet twice daily orally.

Note: Indicate you have to make 12 such powder each containing above ingredients in the quantity as given above.

Magnesium Sulphate	200g
Sodium Chloride	125g
Sodium Bicarbonate	30g
Aqua (water)	560ml

Mft mist Sig ½ BID orally

Note: indicate that the above drug is to be made into mixture and divided into two equal parts and be given each half two times in a day. You can also give equivalent amount of drug for another day or two if the condition of animal warrants it.

### 41.11 Carminative

Carminative: Drugs which prevent the formation and help in expulsion of gases from gastro-intestinal tract.

Cattle

Formalin	5ml
Sodium Chloride	150g
Water	500ml

Mft mist Sig ½ BID orally.

Note: indicate that the above drug is to be made into mixture and divided into two equal parts and be given each half two times in a day. You can also give equivalent amount of drug for another day or two if the condition of animal warrants it.

### 41.12 Antizymotic

Antizymotic: drugs or agents which arrest/control fermentation.

Cattle

Formalin	-	15ml
Aqua ad	-	1000ml

Mft haust Sig ½ BID orally.

### 41.13 Purgative for Cattle

Purgative: Drugs or agents which will cause watery evacuation of bowels

Cattle

Magnesium Sulphate- 250g  
Sodium Chloride - 150g  
Aqua ad - 1000ml  
Mft haust Sig now  
orally

#### 41.14 Alterative

Alterative: Drugs which modify tissue changes and improve nutrition to various organs (to be given in condition of debility and weakness)

Cattle

Mag Sulph - 30g  
Sod. Bicarb - 8g  
Ferri Sulph - 15g  
Mft pulv 1, such 16 Sig 1 powder twice daily in feed.  
Mag Sulph - 60g  
Sulphur - 8g  
Mft pulv 1, such 16 Sig 1 powder twice daily in feed.

#### 41.15 Febrifuge

Febrifuge : Drugs which reduce the temperature in fever

Sod Salicylate - 60g  
Sod Bicarb - 60g  
Mft pulv Sig ½ BID  
orally.

#### 41.16 Antiseptic and Absorbent

Antiseptic and Absorbent

Mag sulph - 20gms  
Glycerine - equal parts  
Mft paste, Sig pack the infected wound or apply on region of edema

**SECTION G**  
**ANNEXURES**

# ANNEXURE

## A. DOSE CALCULATIONS AND UNITS

Accurate dosing is critical to the proper utilization of all pharmaceuticals. To calculate the correct dose of drug you need to know the concentration of the drug, the weight of the animal, and the recommended dose rate of the drug in question for the specific animal you are administering the drug to.

### *Units of measurements*

SI unit is another name for the metric system of measurement. The aim of metrication is to make calculations easier than with the imperial system (which includes ounces, pounds, stones, inches, pints etc). SI stands for *Systeme Internationale* and it is now recognized as the standard system for measurement in most disciplines around the world. The SI system defines a base unit for a particular measurement (for example the gram for measuring weight) and a prefix (e.g. kilo, milli) when the actual numbers in the measurement become very large or very small. For example one millionth of a gram could be written as 0.000001g or 1mcg. The second version is easier to read than the first and easier to work with once you understand how to use units and prefixes. It is also less likely to lead to errors, especially when administering drug doses.

*Conversion table:*

Kilogram	Hectogram	Decagram	Gram	Decigram	Centigram	Milligram
1	0	0	0	0	0	0
	1	0	0	0	0	0
		1	0	0	0	0
			1	0	0	0
				1	0	0
					1	0

1 gram = 1000 milligrams and 1 milligram = 1000 Micrograms  
300mg = 0.3g 0.5g = 500mg  
750micrograms = 0.75 mg  
2500ml = 2.5l 0.025m = 25mm 0.05mg = 50 micrograms

### Common routes of drug administration include:

- a) Oral administration
- b) Parenteral administration
  - ❖ Intravenous
  - ❖ Intramuscular
  - ❖ Subcutaneous
  - ❖ Intraperitoneal
  - ❖ Intrathoracic
  - ❖ Intradermal
- c) Inhalation (pulmonary route)
- d) Topical administration (local application)

Pharmaceutical preparations are often expressed as:

**Percentage:** It simply means per hundred. 5% means 5 parts of the active ingredient in 100 parts of the preparation. For example a 10% solution of xylazine is 100mg/ml and a 2% solution of xylazine is 20mg/ml. Percentage concentration of the drug is expressed in 3 ways.

- ❖ **Weight in weight (w/w):** Is the percentage of solids in solids. E.g. Ointments and powders. However, percentage solutions of solids in liquids are rarely made weight in weight (e.g. when both solids and liquids are taken in weight).
- ❖ **Weight in volume (w/v):** Percentage solutions of liquids are usually made weight in volume. These types of percentage solutions are common in pharmacy where solids are taken by weight and liquids are taken by volume. Eg. Mixtures and lotions. **Mg/ml** - Manufacturers usually provide concentrations of their product in milligrams (mg) of drug per (ml) of solvent.
- ❖ **Volume in volume (v/v):** Percentage solutions of liquids are usually made volume in volume. Since both solute and the solvent liquid are taken by volume, use of same subunit of volume for both is essential. Eg. Emulsions and spirits.

**Parts per million (ppm):** This is the way of expressing strength particularly concentrations of very dilute preparations. A 1 ppm solution contains one part of the solute in one million parts of solution. It is important that two parts must have same units except in metric system where 1gm = 1ml.

### **International unit (IU):**

International Units per ml of solvent are used for some preparations like



penicillin and some of the fat soluble vitamins. This is actually a measurement of activity and doses use the same unit of measure to make calculations easier.

***Powders:***

You may receive drugs in a powdered form and be given the milligram/gram of active drug in the vial. For example, Dicrysticin sulfate comes in powdered form with 2.5gm (2500mg) per vial.

***Percent solutions:***

One part of a substance solid or liquid mixed with 99 parts of a solvent to make a total of 100 parts of the prescribed formulation makes 1-% solution. In metric system 1gm of solid or 1ml of a liquid dissolved in 99 ml of solvent to make 100 ml of prepared solution makes 1-% solution.

Examples of solution of various strength.

Strength percentage

1 in 1 100%

1 in 10 10%

1 in 100 1%

1 in 1000 0.1%

1 in 10,000 0.01%

To convert into percentage

1 in 400 =  $1/400 \times 100 = 0.25\%$  1 in 700 =  $1/700 \times 100 = 0.143\%$

1 in 2500 =  $1/2500 \times 100 = 0.04\%$

3 in 1000 =  $3/1000 \times 100 = 0.3\%$

Some examples of calculations:

Anesthetics

**Thiopentone sodium injection:** Calculate the total dose for a dog weighing 12kg at the dose rate of 25mg/kg body weight! For safety reasons the drug should be administered as 2.5% solution.

Comes as 0.5gm vial, dose rate is 25mg/kg as 2.5% solution and body weight of animal is 12kg.

To prepare 2.5% solution

2500mg in 100ml 2.5% Solution



500mg in ? 2.5% solution =  $100 \times 500/2500 = 20\text{ml} = 25\text{mg/ml}$

Total dose required  
=  $12 \times 25$   
= 300mg

Therefore, total dose will be  $300/25 = 12\text{ml}$

**Xylazine hydrochloride:**

Comes as 2% solution  
Required dose rate is 1mg/kg  
To be given for 10 kg dog  
Total dose required  $1 \times 10 = 10\text{mg}$   
Solution contains 20mg/ml = 0.5ml

**Antibiotics**

Example:  
The conc. of antibiotic is 50 mg/ml  
Dose rate is 5-mg/kg body weight  
The weight of the animal is 300 kg.  
Calculation:  
The animal weighing 300 kg @ dose rate of 5 mg/kg body wt. = 1500 mg  
The conc. of antibiotic is 50 mg/ml,  
Therefore the animal of 300 kg requires =  $1500/50 = 30$  ml of antibiotic.

**Deworming drugs**

Example:  
A cow suffering with chronic diarrhea is found to have 500 epg of fasciola.  
Using Triclabendazole 900 mg bolus, find the quantity of bolus to be given to the animal weighing 430 kg at the dose rate of 10-mg/kg body wt.  
Solution:  
Dosage =  $430 \text{ kg} \times 10\text{mg/kg body wt} = 4300 \text{ mg}$   
As one bolus contains 900 mg of triclabendazole, 4300 mg will be in =  $4300/900 = 5$  bolus approximately.

**Dilution of liquids**

The basic formula  
Concentration of final solution (% or ratio)  
Total quantity of stock solution = ..... X Total quantity  
of Concentration of stock Final soln.

Example:

We have cythion with stock concentration of 50%. Making a total of 5 litres of diluted solution, how much quantity of cythion we need to mix with water to make a final concentration of 2%?

Solution:

Concentration of stock cythion.....50%

Concentration of final solution.....2 %

Total quantity of final solution.....5 litres (5000 ml)

Substituting in the above formula:

$\frac{2}{50}X(?) = \dots\dots\dots X \text{ 5000 ml} = \frac{2}{50} \times 5000 = 200 \text{ ml}$ . Of stock cythion i.e. add 200 ml of stock cythion in 4800 ml of water to make 2% final concentration of cythion.

Example:

Make a 1/200 dilutions of a neat sample in a final volume of 4 ml.

$$4000 = 200 \times X \text{ (4ml = 4000 } \mu\text{l)}$$

$$X = 4000/200 = 0.02 \text{ ml (20 } \mu\text{l)}$$

i.e. 0.02 ml of neat sample in 3.98 ml water or 20  $\mu\text{l}$  in 3980  $\mu\text{l}$  of water.

**Intravenous Drips:**

The rate of flow of fluid down intravenous infusion lines must be regulated and this is often controlled by a device known as an infusion controller. The controller measures precise volumes of liquid and releases tiny droplets, each of exactly the same volume, down the IV line (tube) at precise intervals. The infusion controller has a thumb-wheel which allows the operator to alter the flow of liquid. Some controllers require you to set the Flow Rate, which is measured in Millilitres per Hour. Others require you to set the Drip Rate, measured in Drips per Minute. It is important that you know which you are dealing with. This will be written on the machine itself. To calculate the Flow Rate, this is simply the volume in millilitre divided by the duration in hours. Both these values will be prescribed.

Example: A dog requires 500ml IV infusion over twelve hours. What is the flow rate?

Answer: 500 divided by 12 is 41.66ml/hr = 42ml/hr (Round off).

**Fluid deficit calculation**

*Body weight X % dehydration = volume (L) to correct*

**Extent of dehydration**

<b>Dehydration</b>	<b>Physical examination findings</b>
Mild dehydration (~5%)	Slight eyeball recession, skin tent slightly prolonged (2-4 seconds), mucous membrane moist
Moderate dehydration (~8%)	Eyes obviously sunken, skin tent obviously prolonged (4-8 seconds), mucous membrane tacky
Severe dehydration (>10%)	Eyes severely sunken into orbits/severe enophthalmos, skin remains tented indefinitely, mucous membranes extremely dry, weak/thready pulse, hypotension, altered level of consciousness

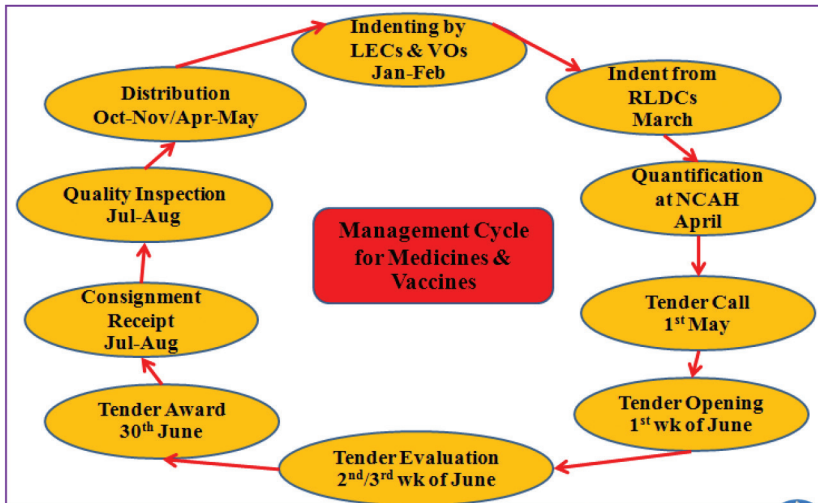
## B. STRATEGIES FOR PROCUREMENT, DISTRIBUTION, MANAGEMENT AND MONITORING SYSTEM FOR ESSENTIAL VETERINARY DRUG PROGRAM 2015

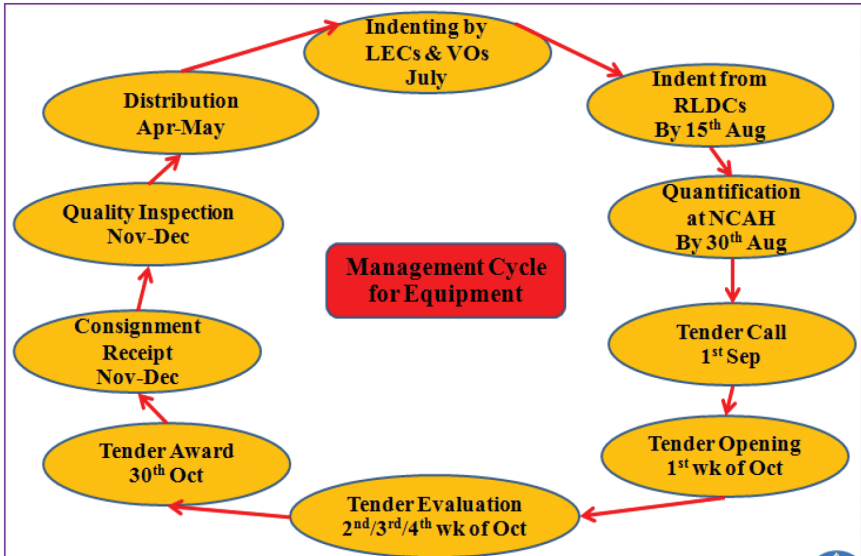
### A. Budget Allocation for Drugs, Vaccines and Equipment

- ❖ Budgetary ceiling for Dzongkhags/Farms/Central Agencies will be implemented for procurement of medicines
- ❖ Budgetary ceiling will not apply for procurement and distribution of vaccines, equipment and non-drug items

### B. Procurement and Management Cycle for EVDP

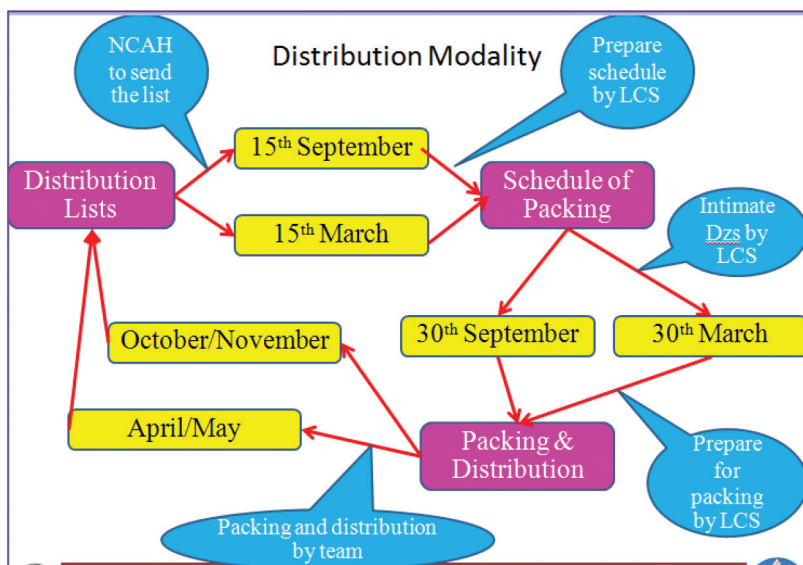
- ❖ Indent submission for veterinary drugs, vaccines and equipment shall be done in the prescribed formats distributed by the DVEU
- ❖ Indents will be submitted to respective EVDP Focal persons in the region under each RLDC and who will compile and then submit to NCAH
- ❖ Fast-track tendering process for medicines and vaccines will be implemented
- ❖ Normal tendering process will be followed for equipment and non-drug items
- ❖ The new management cycles shall be strictly adhered as under





### C. Distribution Modality for EVDP

- ❖ Distribution cycles for medicines and vaccines will be 2 times distribution
  - 1<sup>st</sup> distribution in around October/November
  - 2<sup>nd</sup> distribution in April/May
- ❖ Emphasis on presence of representatives from Dzs/Farms/Central Agencies during packing and distribution
- ❖ Distribution will be done till DVH level by LCS
- ❖ The Dzongkhag EVDP focal persons will segregate the drugs and equipment as per the geog indent and dispatch to the centers after collection from LCS
- ❖ Emergency or ad hoc distribution will be made by the DVEU/LCS based on the requirements submitted by individual agency and strictly upon approval from NCAH only



#### D. Regional and Dzongkhag EVDP Focal Persons

- ❖ Regional and Dzongkhag EVDP focal persons will be identified and appointed
- ❖ The focal persons will be revised as and when required
- ❖ Responsibilities and ToR were developed for EVDP focal persons and discussed below

Region	EVDP Focal Person	Agency
Western	Dr. Sonam Jamtsho	RLDC, Tsimasham
Eastern	Dr. Lungten	RLDC, Kanglung
East-central	Dr. Tshewang Gembo	RLDC, Zhemgang
West-central	Dr. Rinzin Pem	RLDC, Wangdue

**\*\* Dz VO/DVH In-charge will be Dz EVDP focal persons by default**

#### *Roles and ToR of Dzongkhag EVDP Focal Persons*

- ❖ The DVOs or DVH In-charges will be the EVDP focal person of the concerned Dzongkhag
- ❖ Technical backstopping to the field colleagues on usage
- ❖ Involve during the time of national drug review (addition and deletion of drugs)

- ❖ Timely monitoring and evaluation of drugs and equipment in the LECs/RNRECs
- ❖ Provide refresher course to the field colleagues especially with regard to compounding and usage of the non-patent drugs at regular interval in consultation with RLDC
- ❖ Intra Dzongkhag drug mobilization
- ❖ Collect annual drug, vaccines and equipment indents/requisitions from their respective LECs/RNRECs and compile and submit to regional EVDP focal points
- ❖ Reception, verify and collection of drugs once it arrives in DVHs from LCS and segregate drugs as per the geog drug indent and dispatch to the centers

### ***Roles and ToR for Regional EVDP Focal Persons***

- ❖ Co-ordinate and bridge a link between NCAH and DVH
- ❖ Compile, verify and submit the drug indent to NCAH
- ❖ Update and synchronize the drug indenting format in the region
- ❖ Collect and compile the drug reports as and when required
- ❖ Initiate and follow up on the inter and intra dzongkhag drug mobilization
- ❖ Monitor and standardize the EVDP at DVH and LECs/RNRECs
- ❖ Technical backstopping on the drug usage, storage, formulary, and proper dispensing at the centre and Dzongkhag level
- ❖ Maintain buffer stock of drugs to be supplied during times of emergency
- ❖ Regulate and ensure minimum standards in compliance with the DRA norms with feedbacks and recommendations
- ❖ Monitor effective maintenance of expired drugs inventory
- ❖ Ensure proper disposal of expired drugs with fulfillment of the required DRA regulations and procedures before disposal
- ❖ Scrutinize on failing to meet the minimum requirements
- ❖ Perform surprise inspection of stock of drugs and equipment in LCS, Phuntsholing
- ❖ Coordinate and lead the supervision during drug and equipment inspections/verifications and during packing and distribution of drugs and equipment

### **E. Strategy for Verification and Inspection**

- ❖ Permanent team will be instituted on rooster basis
- ❖ The team will be revised as and when required



- ❖ The verification and inspection shall be done as per the standard guidelines & standard formats developed by DVEU

<b>Verification/Inspection Team</b>	<b>Region</b>	<b>Schedule</b>
*Dr. Sonam Jamtsho, RLDC, Tsimasham Dr. Nima Wangdi, DVH, Chukha 1 NCAH staff	Western	July to September
*Dr. Lungten, RLDC, Kanglung Dr. Karma Phuntsho, DVH, S/jongkhar 1 NCAH staff	Eastern	October to December
*Dr. Tshewang Gembo, RLDC, Zhemgang Dr. Pema Wangchuk, DVH, Zhemgang 1 NCAH staff	East-central	January to March
*Dr. Rinzin Pem, RLDC, Wangdue Dr. Pema Jatsho, DVH, Punakha 1 NCAH staff	West-central	April to June

*\*Team leader for the respective region*

#### **F. Mechanism of EVDP Monitoring**

- ❖ The monitoring of EVDP shall be done on 2 basis
  - ✓ Routine – Four monthly & Two monthly reporting system
  - ✓ Ad hoc – On demand
- ❖ The Dzongkhag EVDP focal persons will monitor the LECs/RNRECs in their respective Dzongkhag and submit monitoring reports on 2-monthly basis to regional EVDP focal persons who will compile and submit to NCAH
- ❖ The regional EVDP focal persons will monitor the DVHs, Farms and Central Agencies in their respective region and submit the monitoring reports on 4-monthly basis to NCAH
- ❖ The EVDP monitoring reports will be submitted as above for those visits and monitoring done for respective centers and it is not compulsory to do for every geog centers/farms/CAs in the respective Dzongkhag or region
- ❖ The monitoring reports will be submitted in the standard formats developed by DVEU

#### **G. Module for transportation back of expired drugs from animal health centers to LCS.**

- ❖ DVOs/DVH in-charge should monitor and collect information on expired drugs from the geogs

- ❖ Geog in-charge after completing ground formalities will submit the note sheet to DLO to be endorsed by Dasho Dzongda and acquire write-off approvals
- ❖ After approval of write off geog in-charges should submit the expired drugs to DVO/DVH in-charge
- ❖ Central farms/central Agencies will acquire write-off approvals directly from Department/Ministry and then submit the expired medicines to respective regional EVDP focal persons
- ❖ DVOs/DVH in-charge should inform their respective regional EVDP focal persons in RLDCs about the expired drugs in the dzongkhag
- ❖ Collection of expired drugs should be made by RLDC for further disposal
- ❖ The SOPs for disposal of expired veterinary drugs shall be done as per the pharmaceutical waste management guidelines developed by DRA and available in the DRA website

## H. Ownership and Accountability for EVDP

Key areas for ownership	Responsibility	Accountability
Budgeting and fund availability	Head, DVEU	PD, NCAH
Indent preparations	LECs/RNRECs/CFs/CAs	DVOs/Agency heads
Indent submission	DVOs	Regional EVDP focal persons
Tendering process	DVEU/LCS	Head, DVEU
Drug verification and inspection	DVEU/LCS	Respective Inspection Team
Packing and distribution	DVEU/LCS/Dz Reps	DLOs
Proper store management	Asstt. Store In-charge	Head, LCS
Emergency/ad hoc medicine stock	Asstt. Store In-charge	Head, LCS
Drug expiry and disposal	DLOs/VOs/LECs/Heads of agencies	In-charges of LECs/Farms/Agencies
2 monthly EVDP monitoring and reporting	In-charges of LECs/RNRECs	Dz EVDP focal persons
4 monthly EVDP monitoring and reporting	In-charges/heads of DVHs/Farms/Agencies	Regional EVDP focal persons

## **SECTION H**

# **ESSENTIAL VETERINARY DRUGS, VACCINES AND EQUIPMENT LIST (EVDL 2016)**

**ESSENTIAL VETERINARY DRUG LIST 2016**  
**A: Categorization of Essential Veterinary Drug List at different Animal Health Facilities**

SN	Category	Code	Generic name	Composition	Presentation	AH Facilities
1	Analgesic/Antipyretic/Anti-inflammatory	analginpito.inj	Analgin Inj	500mg/ml analgin	30ml vial	All
2	Analgesic/Antipyretic/Anti-inflammatory	flunimeg.inj	Flunixin Meglumine Inj	50mg/ml	50mg/ml, 10ml vial	NAH/CVHs/D VHS
3	Analgesic/Antipyretic/Anti-inflammatory	ibuprofen.tab	Ibuprofen Tab	400mg/tab	400mg tab, 10 tab/strip	All
4	Analgesic/Antipyretic/Anti-inflammatory	ketoprofen.inj	Ketoprofen Inj	100mg/ml	100mg/ml, 15ml vial	NAH/CVHs/D VHS
5	Analgesic/Antipyretic/Anti-inflammatory	mefapara.inj	Mefenamic acid+Paracetamol Inj	50mg+150mg per ml	30ml vial	NAH/CVHs/D VHS
6	Analgesic/Antipyretic/Anti-inflammatory	melox.inj	Meloxicam Inj	5mg/ml	5mg/ml, 30ml vial	NAH/CVHs/D VHS
7	Analgesic/Antipyretic/Anti-inflammatory	meloxpara.bolus	Meloxicam+Paracetamol Bolus	100mg+1500mg /bolus	2 boli/strip	All
8	Analgesic/Antipyretic/Anti-inflammatory	meloxpara.inj	Meloxicam+Paracetamol Inj	5mg+150mg per ml	5mg+150mg/ml, 30 ml vials	All
9	Analgesic/Antipyretic/Anti-inflammatory	phenbutanal.inj	Phenylbutazone + Analgin Inj (Esgipyrin)	150mg+150mg/ml	5ml vial	NAH/CVHs/D VHS
10	Analgesic/Antipyretic/Anti-inflammatory	phenbuta.inj	Phenylbutazone+Sodium Salicylate Inj	200mg+20mg/ml	30ml vial	All
11	Antacids/Antizymotics	alumin.sol	Aluminium Hydroxide Antacids	450ml/bottle	450ml bottle	All
12	Antacids/Antizymotics	omepra20.tab	Omeprazole Tab - 20mg tab	20mg/tab	20mg tab, 1000 tab/jar	NAH/CVHs/D VHS
13	Antacids/Antizymotics	omepra40.tab	Omeprazole Tab - 40mg tab	40mg/tab	40mg tab, 10 tab/strip	NAH/CVHs/D VHS
14	Antacids/Antizymotics	panto.inj	Pantoprazole Inj	4mg/ml	4mg/ml, 40mg vial	NAH/CVHs/D VHS

15	Antiacids/Antizymotics	randt.inj	Ranitidine Inj	25mg/ml	25mg/ml, 2ml ampoule	NAH/CVHs/D VHs
16	Antiacids/Antizymotics	silica.suspension	Silica in Demethicone	1% suspension	1%, 100ml bottle	All
17	Anthelmintics	alabend.gra	Albendazole Granules/Powder - 30gm sachet	20% granules	30gm sachet	All
18	Anthelmintics	alabend.tab	Albendazole Tab	150mg/tab	10 tab/strip	All
19	Anthelmintics	closantel.susp	Closantel Oral Suspension	15% suspension	500ml bottle	NAH/CVHs/D VHs
20	Anthelmintics	closanivermec.inj	Closantel+Ivermectin Inj	125mg+5mg/ml	20ml vial	NAH/CVHs/D VHs
21	Anthelmintics	closental.bol	Closental Bolus - 10 boli/strip	1.5gm/bolus	10 boli/strip	NAH/CVHs/D VHs
22	Anthelmintics	dichlorophen.tab	Dichlorophen Tab	0.5gm/tab	0.5gm tab, 100 tab/jar	NAH/CVHs/D VHs
23	Anthelmintics	fenbenda.bol	Fenbendazole Bolus	1.5gm bolus	1.5gm bolus, 5 boli/strip	All
24	Anthelmintics	fenbenda.pow	Fenbendazole Powder	25% W/W	25%, 120gm jar	All
25	Anthelmintics	fenbenda.tab	Fenbendazole Tab	750mg/tab	750mg tab, 10 tab/strip	All
26	Anthelmintics	ivermec.inj	Ivermectin Inj	1% W/V	10ml vial	All
27	Anthelmintics	leva.inj	Levamisole Hcl Inj	75mg/ml	75mg/ml, 30ml vial	All
28	Anthelmintics	levaoxyclo.suspension	Levamisole+Oxyclozani de Suspension	1L jar	1L jar	All
29	Anthelmintics	niclo10tab.tab	Niclosamide Tab - 10 tab/strip	500mg/tab	500mg tab, 10 tab/strip	All
30	Anthelmintics	niclo6tab.tab	Niclosamide Tab - 6 tab/strip	500mg/tab	500mg tab, 6 tab/strip	All
31	Anthelmintics	oxyclo.suspension	Oxyclozanide Suspension	3.4% W/V suspension	1litre jar	All
32	Anthelmintics	piperazine.cap	Piperazine Citrate Capsule	320mg/capsule	10 capsule/strip	All

33	Anthelmintics		piperazine40.sol	Piperazine Citrate Solution - 40%	40% solution	40%, 450ml bottle	All
34	Anthelmintics		piperazine38.sol	Piperazine Hexahydrate Solution - 38%	38% solution	38%, 120ml bottle	All
35	Anthelmintics		prazi.tab	Praziquantel Tab	50mg/tab	50mg tab, 50 tab/jar	All
36	Anthelmintics		prazifeben.tab	Praziquantel+Febendazole Bolus - 2 boli/strip	50mg+150mg/tab	2 boli/strip	All
37	Anthelmintics		prazipyratfeben.tab	Praziquantel+Pyrametl+Febental Tab - 10 tab strip	50mg, 144mg & 150mg/tab	10 tab strip	NAH/CVHs/D VHS
38	Anthelmintics		rafoleva.suspension	Rafoxanide+Levamisole Suspension	1.5% W/V suspension	1 litre jar	All
39	Anthelmintics		tetrami.pow	Tetramisole Hcl Powder	30% powder	30%, 100gm tin/jar	All
40	Anthelmintics		tricla.bolus	Triclabendazole Bolus	900mg bolus	900mg bolus, 5 boli/strip	All
41	Anticoccidial Drugs		amprsulf.pow	Amprolium+Sulfaquinoxaline Powder	100g+100g/sachet	100gm sachet	NAH/CVHs/D VHS/CFs/CAs
42	Anticoccidial Drugs		diavertd.pow	Diaveridine + Sulphaquinoxaline Powder	3.3%+18.7% sachet	100gm sachet	NAH/CVHs/D VHS/CFs/CAs
43	Anticoccidial Drugs		furalronid.pow	Furaladone+Ronidazole Powder	20%+7% per 100gm	100gm jar	NAH/CVHs/D VHS/CFs/CAs
44	Anticoccidial Drugs		sulphaehlor.pow	Sulphaclorpyrazine Sodium Powder	30gm in 100gm	100gm sachet	All
45	Anticoccidial Drugs		sulphatetra.pow	Sulphaquinoxaline+Tetracycline Powder	100 gm/sachet	100gm sachet	NAH/CVHs/D VHS/CFs/CAs
46	Anticoccidial Drugs		sulphathio.sol	Sulphathiozole Solution	20% solution	20%, 100ml bottle	NAH/CVHs/D VHS/CFs/CAs
47	Anti-convulsant Drugs		diaze.inj	Diazepam Inj	5mg/ml	5mg/ml, 2ml ampoule	NAH/CVHs/D VHS
48	Anti-convulsant Drugs		phenobarb.tab	Phenobarbitone Tab	30mg/tab	30mg tab, 10 tab/strip	NAH/CVHs/D VHS

49	Anti-convulsant Drugs	phenytoin.tab	Phenytoin Tab	10mg/tab	1000 tab/jar	NAH/CVHs/D VHs
50	Anti-diarrheal Drugs	lopera10tab.tab	Loperamide Tab	2mg/tab	10 tab/strip	NAH/CVHs/D VHs
51	Anti-diarrheal Drugs	lopera4tab.tab	Loperamide Tab - 4 tab/strip	2mg/tab	2mg/tab, 4 tab/strip	NAH/CVHs/D VHs
52	Anti-diarrheal Drugs	metrofuraloper.bolus	Metronidazole+Furazoli done+Loperamide Bolus	4boli/strip	4 boli/strip	All
53	Anti-diarrheal Drugs	metrolop.tab	Metronidazole+Loperam ide Tab	1000mg+7.5mg /tab	4 tab/strip	All
54	Anti-dotes/Anesthetic Reversals	atrop10.inj	Atropine Sulphate Inj - 10ml	1mg/ml	10ml vial	All
55	Anti-dotes/Anesthetic Reversals	atrop1.inj	Atropine Sulphate Inj - 1ml	1mg/ml	1ml ampoule	All
56	Anti-dotes/Anesthetic Reversals	yohim.inj	Yohimbine Hcl Inj	20ml/vial	20ml vial	NAH/CVHs/D VHs
57	Anti-emetic Drugs	metoclo.inj	Metoclopramide Hcl Inj	5mg/ml	5mg/ml, 10ml vial	NAH/CVHs/D VHs
58	Anti-emetic Drugs	ondan.inj	Ondansetron Inj	2ml/ampoule	2ml ampoule	NAH/CVHs/D VHs
59	Anti-emetic Drugs	ondan.tab	Ondansetron Tab	4mg/tab	4mg tab, 10 tab/strip	NAH/CVHs/D VHs
60	Anti-emetic Drugs	prometh.tab	Promethazine Tab	10mg/tab	10mg tab, 10 tab/strip	NAH/CVHs/D VHs
61	Anti-fungals	grisco.tab	Griseofulvin Tab	12.5mg/tab	12.5mg tab, 10 tabs/strip	NAH/CVHs/D VHs
62	Anti-fungals	ketocon.tab	Ketoconazole Tab	200mg/tab	200mg tab, 10 tab/strip	NAH/CVHs/D VHs
63	Anti-histaminics	chloram10.inj	Chlorphenaramine Maleate Inj - 10ml	10mg/ml	10ml vial	All
64	Anti-histaminics	chloram30.inj	Chlorphenaramine Maleate Inj - 30ml	10mg/ml	30ml vial	All
65	Anti-histaminics	chloram.tab	Chlorphenaramine tab	8mg/tab	10 tab/strip	All

66	Antimicrobials	amika2.inj	Amikacin Sulphate Inj - 2ml	250mg/ml	2ml vial	NAH/CVHs/D VHs
67	Antimicrobials	amika5.inj	Amikacin Sulphate Inj - 5ml	250mg/ml	5ml vial	NAH/CVHs/D VHs
68	Antimicrobials	amoxicoli.pow	Amoxicillin trihydrate+Colistin sulfate Powder	200gm/sachet	100gm sachet	NAH/CVHs/D VHs/CFs/CAs
69	Antimicrobials	amoxtri.bol	Amoxycillin Trihydrate Bolus	1.5gm bolus	1.5gm, 2 boli/strip	All
70	Antimicrobials	ampiclox.inj	Ampicillin + Cloxacillin Inj	1gm+1gm/vial	2gm vial	All
71	Antimicrobials	ampi250.inj	Ampicillin Sodium Inj - 250mg	250mg/vial	250mg vial	All
72	Antimicrobials	ampi500.inj	Ampicillin Sodium Inj - 500mg	500mg/vial	500mg vial	All
73	Antimicrobials	benza12.inj	Benzathine Penicillin Inj - 12 lacs	1200000 IU	12,00000 IU vial	All
74	Antimicrobials	benza24.inj	Benzathine Penicillin Inj - 24 lacs	2400000 IU	24,00000 IU vial	All
75	Antimicrobials	benza48.inj	Benzathine Penicillin Inj - 48 lacs	4800000 IU	48,00000 IU vial	All
76	Antimicrobials	benza6.inj	Benzathine Penicillin Inj - 6 lacs	600000 IU	600000 IU vial	All
77	Antimicrobials	cefo1gm.inj	Cefotaxime Inj - 1gm/vial	1gm/vial	1gm vial	NAH/CVHs/D VHs
78	Antimicrobials	cefo500.inj	Cefotaxime Inj - 500mg/vial	500mg/vial	500mg vial	NAH/CVHs/D VHs
79	Antimicrobials	cefo.tab	Cefotaxime Tab	500mg/tab	500mg tab	NAH/CVHs/D VHs
80	Antimicrobials	cefrifitazo.inj	Ceftriaxone & Tazobactam Inj	3g+375mg/vial	3g+375mg vial	NAH/CVHs/D VHs
81	Antimicrobials	cefrin.inj	Ceftriaxone Inj	500mg/vial	500mg vial	NAH/CVHs/D VHs



82	Antimicrobials	cepha. bol	Cephalexin Bolus	1.5gm bolus	1.5gm bolus, 2 boli/strip	NAH/CVHs/D VHS
83	Antimicrobials	cepha. sus	Cephalexin Dry Suspension	30ml suspension	30ml bottle	NAH/CVHs/D VHS
84	Antimicrobials	cepha. pow	Cephalexin Oral Powder	7.5%/20gm sachet	20gm sachet, 7.5%	NAH/CVHs/D VHS
85	Antimicrobials	Cefquin.inj	Cefquinome-Vet Inj	500mg/vial	500mg vial	NAH/CVHs/D VHS
86	Antimicrobials	cotrimazine.inj	Co-Trimazine Inj	80+400mg/ml	30ml vial	All
87	Antimicrobials	doxycycl.tab	Doxycycline Hyclate Tab	50mg/tab	50mg tab, 100 tab/jar	NAH/CVHs/D VHS
88	Antimicrobials	enroflox.inj	Enrofloxacin Inj	100mg/ml	100mg/ml, 15ml vial	NAH/CVHs/D VHS
89	Antimicrobials	enroflox.tab	Enrofloxacin Tab	150mg/tab	150mg tab, 10 tab/strip	NAH/CVHs/D VHS
90	Antimicrobials	erythro.inj	Erythromycin Lactobionate Inj	500mg/ml	500mg/ml vial	NAH/CVHs/D VHS
91	Antimicrobials	genta2ml.inj	Gentamicin Inj - 2ml	40mg/ml	2ml vial	All
92	Antimicrobials	genta30ml.inj	Gentamicin Inj - 30ml	40mg/ml	30ml vial	All
93	Antimicrobials	levoflox.inj	Levofloxacin Inj	10% solution	10%, 15ml vial	NAH/CVHs/D VHS
94	Antimicrobials	linco.inj	Lincomycin Hcl Inj	5ml/vial	5ml vial	NAH/CVHs/D VHS
95	Antimicrobials	metro.inj	Metronidazole Inj	500mg/ml	500mg/ml, 100ml bottle	NAH/CVHs/D VHS
96	Antimicrobials	metro10tab.tab	Metronidazole Tab - 10 tab/strip	400mg/tab	400mg tab, 10 tab/strip	All
97	Antimicrobials	metro100tab.tab	Metronidazole Tab - 100 tab/jar	400mg/tab	400mg tab, 100 tab/jar	All
98	Antimicrobials	metrofura.bolus	Metronidazole+Furazolidone Bolus	4boli/strip	4 boli/strip	All
99	Antimicrobials	oxy/la.inj	Oxytetracycline LA Inj	200mg/ml	200mg/ml, 30ml vial	LEC:s/RNRECs /CFS

100	Antimicrobials	oxysa.inj	Oxytetracycline SA. Inj	50mg/ml	50mg/ml, 50ml vial	LECs/RNRECs /CFs
101	Antimicrobials	penicillinG.inj	Penicillin G Procaine in Oil Inj	3 lacs IU/ml	10ml vial	NAH/CVHs/D VHs
102	Antimicrobials	procainepenicillin.inj	Procaine penicillin G+Penicillin G Sodium	15 lacs+5 lacs/vial	20ml vial	NAH/CVHs/D VHs
103	Antimicrobials	streptoIg.inj	Streptomycin Inj	1gm/vial	1gm vial	NAH/CVHs/D VHs/CFs/CAs
104	Antimicrobials	streptopen2g.inj	Streptopenicillin Inj - 2.0gm vial	2.0gm/vial	2.0gm vial	All
105	Antimicrobials	streptopen2.5g.inj	Streptopenicillin Inj - 2.5gm vial	2.5gm/vial	2.5gm vial	All
106	Antimicrobials	sulpha.bolus	Sulphadimidine Bolus	5gm per 100gm	4 boli/strip	All
107	Antimicrobials	sulpha.inj	Sulphadimidine Inj	33.33% solution	33.33%, 100ml vial	All
108	Antimicrobials	tetra.pow	Tetracycline Hcl Powder - 100gm sachet	5gm per 100gm	100gm sachet	All
109	Antimicrobials	tetraeryvita.pow	Tetracycline Hcl+Erythromycin+Vitamin Powder	135g+25g+Vitamin/kg	100gm sachet	NAH/CVHs/D VHs/CFs/CAs
110	Antimicrobials	trimetsulphmethox.inj	Trimethoprim + Sulphamethoxazole Inj	80mg+400mg/5 ml	30ml vial	NAH/CVHs/D VHs
111	Antimicrobials	trimethsulph10.bolus	Trimethoprim+Sulphadiazine Bolus - 10 boli/strip	400mg+2gm bolus	10 boli/strip	All
112	Antimicrobials	trimethsulph4.bolus	Trimethoprim+Sulphadiazine Bolus - 4 boli/strip	400mg+2gm bolus	4 boli/strip	All
113	Antimicrobials	trimethsulph.inj	Trimethoprim+Sulphadiazine Inj - 30ml vial	80mg+400mg/ml	30ml vial	All
114	Antimicrobials	tylosindoxy.pow	Tylosine + Doxycycline Powder	100mg/pkt	100gm jar	NAH/CVHs/D VHs/CFs/CAs
115	Antineoplastics	lithanti.inj	Lithium Antimony Thiomalate Inj	6% W/V	50ml vial	All

116	Antineoplastics	methotrex.tab	Methotrexate Sodium Tab - 2.5mg tab, 10 tab/strip	2.5mg/tab	2.5mg tab, 10 tab/strip	NAH/CVHs/D VHs
117	Antineoplastics	vincryst.inj	Vincristine Sulfate Inj	1mg/ml	1mg/ml, 1ml ampoule	NAH/CVHs/D VHs/CAs
118	Antiprotozoal Drugs	bupar.inj	Buparvaquone Inj	50mg/ml	20ml vial	NAH/CVHs/D VHs
119	Antiprotozoal Drugs	diamicace.inj	Diminazine Aceturate	23.6gm vial	23.6gm vial, 30ml vial	All
120	Antiprotozoal Drugs	qpyra.inj	Quinapyramine Sulphate Inj	2.5gm/vial	2.5gm vial	NAH/CVHs/D VHs
121	Antiseptics/Disinfectants	acriflav25.sol	Acriflavine Solution - 25gm	25gm/jar	25gm jar	All
122	Antiseptics/Disinfectants	acriflav5.sol	Acriflavine Solution	5gm/jar	5gm jar	All
123	Antiseptics/Disinfectants	ceptrichlorhex.sol	Cetrimide + Chlorhexidine Solution	15%+7.5% solution	1litre bottle	All
124	Antiseptics/Disinfectants	glutaralde.sol	Glutaraldehyde Derivatives (Kohrsolm)	7gm 100ml	500ml bottle	All
125	Antiseptics/Disinfectants	phenyl.sol	Phenyl Solution	1L bottle	1L bottle	All
126	Antiseptics/Disinfectants	poviod.sol	Povidone Iodine Solution	10% solution	10%, 100ml bottle	All
127	Ayurvedics	antibloatherb.pow	Anti-bloat (Impacdon)	Herbal	1kg packet	LEC§/RNRECs /CFs
128	Ayurvedics	anticoughherb.pow	Anti-cough (KafoI)	Herbal	1kg packet	LEC§/RNRECs /CFs
129	Ayurvedics	antidiatherb.pow	Anti-diarrhoeal (Diarrn)	Herbal	1kg packet	LEC§/RNRECs /CFs
130	Ayurvedics	livertonherb.pow	Livertonic (Livron)	Herbal	100gms sachet	All
131	Ayurvedics	uterinetonicherb.pow	Uterine Tonic Powder (UTRONA)	Herbal	1kg packet	All
132	Bronchodilators	salbu10tab.tab	Salbutamol Tab - 10 tab/strip	4mg/tab	4mg tab, 10 tab/strip	NAH/CVHs/D VHs

133	Bronchiodilators	salbu1000tab.tab	Salbutamol Tab - 1000 tab/jar	4mg/tab	4mg tab, 1000 tab/jar	NAH/CVHs/D VHS
134	Cardiac Stimulants	adre.inj	Adrenaline Inj	1mg/ml	1ml ampoule, 100 amp/box	All
135	Cardiac Stimulants	digox.tab	Digoxin Tab	0.25mg/tab	0.25mg tab, 1000 tab/jar	NAH/CVHs/D VHS
136	Chemical Drugs	charchem.pow	Activated Charcoal Powder	450gm/pkt	450gm packet	All
137	Chemical Drugs	alumchem.pow	Alum Pure Powder	450gm/pkt	450gm packet	All
138	Chemical Drugs	benzochem400.pow	Benzoic Acid Powder - 400gm	400gm/pkt	400gm packet	All
139	Chemical Drugs	benzochem450.pow	Benzoic Acid Powder - 450 gm	450gm/pkt	450gm packet	All
140	Chemical Drugs	boricchem.pow	Boric Acid Powder	400gm/pkt	400gm packet	All
141	Chemical Drugs	cosulpeniachem.pow	Copper Sulfate Pentahydrate Powder	500gm/jar	500gm jar	All
142	Chemical Drugs	copsulchem.pow	Copper Sulphate Powder	450gm/pkt	450gm packet	All
143	Chemical Drugs	ferrosulphchem.pow	Ferrous Sulphate Powder	450gm/pkt	450gm packet	All
144	Chemical Drugs	formachem34-38.liq	Formaldehyde Solution - 34 - 38%	34-38% solution	34 - 38%, 500ml bottle	All
145	Chemical Drugs	formachem34.liq	Formaldehyde Solution - 34%	34% solution	34%, 500ml bottle	All
146	Chemical Drugs	formachem37-40.liq	Formaldehyde Solution - 37 - 40%	37-40% solution	37 - 40%, 500ml bottle	All
147	Chemical Drugs	formachem37-41.liq	Formaldehyde Solution - 37 - 41%	37-41% solution	37 - 41%, 500ml bottle	All
148	Chemical Drugs	glycerchem.liq	Glycerine Solution	500gm/jar	500gm bottle	All
149	Chemical Drugs	hexachem.pow	Hexamine Powder	400gm/pkt	400gm pkts	All
150	Chemical Drugs	liqparachem400.sol	Liquid Paraffin - 400ml	400ml/bottle	400ml bottle	All
151	Chemical Drugs	liqparachem450.sol	Liquid Paraffin - 450ml	450ml/bottle	450ml bottle	All
152	Chemical Drugs	magsulphchem.pow	Magnesium Sulphate Pdr	450gm/pkt	450gm packet	All
153	Chemical Drugs	potperma450.pow	Potassium Permanganate Crystal - 450gm pkt	450gm/pkt	450gm packet	All

154	Chemical Drugs	potperma500.pow	Potassium Permanganate Crystal - 500gm pkt	500gm./jar	500gm packet	All
155	Chemical Drugs	rectispchem.sol	Rectified Spirit Solution	90% alcohol	90%, 450ml bottle	All
156	Chemical Drugs	salichem.pow	Salicylic Acid Powder	450gm/pkt	450gm packet	All
157	Chemical Drugs	sodacidphos.pow	Sodium Acid Phosphate Powder	450gm/pkt	450gm packet	All
158	Chemical Drugs	sodbicarbochem.pow	Sodium Bicarbonate Powder	450gm/pkt	450gm packet	All
159	Chemical Drugs	sodcarbochem.pow	Sodium Carbonate Powder	450gm/pkt	450gm packet	All
160	Chemical Drugs	sulphachem.pow	Sulphanilamide Powder	450gm/pkt	450gm packet	All
161	Chemical Drugs	tinctbenzchem.liq	Tincture Benzoin Compound	70-77% solution	70-77%, 450ml bottle	All
162	Chemical Drugs	tintiod40-47chem.liq	Tincture Iodine (Weak) - 40-47%	40-47% solution	40-47%, 450ml bottle	All
163	Chemical Drugs	tintiod70-77chem.liq	Tincture Iodine -70-77%	70-77% solution	70-77%, 450ml bottle	All
164	Chemical Drugs	turpenchem.liq	Turpentine Oil	400ml/bottle	400ml bottle	All
165	Chemical Drugs	petrojell.liq	White Petroleum Jelly (WSF)	450gm./jar	450gm jar	All
166	Chemical Drugs	zns04chem.pow	Zinc sulphate anhydrous powder	500gm	500gm jar	All
167	Diuretics	acetozol.tab	Acetazolamide Tab	250mg/tab	10tab/strip	NAH/CVHs/D VHs
168	Diuretics	fruse.inj	Furosemide Inj	50mg/ml	10ml vial	All
169	Emetics	apomorpha.tab	Apomorphine Hcl Tab	6.5mg/tab	6.5mg tab, 20 tab/strip	NAH/CVHs/D VHs
170	External Ointments/Sprays	clotrim10.oint	Clotrimazole Ointment - 10 gm	1% ointment	1%, 10gm tube	All
171	External Ointments/Sprays	clotrim15.oint	Clotrimazole Ointment - 15gm	1% ointment	1%, 15gm tube	All
172	External Ointments/Sprays	gamaben.oint	Gamma Benzene Hexachloride Ointment	0.1% Gamma Benzene	100gm tube	All

173	External Ointments/Sprays	gamaben.spray	Gamma Benzene Hexachloride Spray	0.1% Gamma Benzene	50ml bottle	All
174	External Ointments/Sprays	genta.oint	Gentamicin Sulphate Cream/Ointment	50gm/tube	50gm tube	All
175	External Ointments/Sprays	mag.spray	Maggotocidal Spray	Herbal	100ml bottle	All
176	External Ointments/Sprays	nitroflurea.oint	Nitrofurazone Cream	500gm/jar	500gm jar	All
177	External Ointments/Sprays	sisulph.oint	Silver Sulphadiazine Cream	60gm/tube	60gm tube	All
178	External Ointments/Sprays	germokill.oint	Skin Ointment (Germokill)	Herbal	60gm tube	All
179	External Paraeicicides	amit.sol	Amitraz Solution	5% solution	60ml bottle	All
180	External Paraeicicides	counaph.pow	Coumaphos WP Powder	20gm/jar	20gm jar	NAH/CVHs/D VHs
181	External Paraeicicides	cyper1000.sol	Cypermethrin - 1000ml	10% solution	1 litre bottle	All
182	External Paraeicicides	cyper500.sol	Cypermethrin - 500ml	10% solution	500ml bottle	All
183	External Paraeicicides	delta.sol	Deltamethrin	1.25% solution	1litre bottle	All
184	External Paraeicicides	flumeth30.sol	Flumethrin 1% Pour-on Solution (Flupor)	1% solution	30ml bottle	All
185	External Paraeicicides	flumeth50.sol	Flumethrin 1% Pour-on Solution (RP Poupon Vet)	1% solution	50ml bottle	All
186	Eye/Ear Ointments	chloramcol100.oint	Chloramphenicol Eye Ointment - 100 apps	20mg in each gm	1%, 100 applicaps/jar	All
187	Eye/Ear Ointments	chloramcol50.oint	Chloramphenicol Eye Ointment - 50 apps	20mg in each gm	1%, 50 applicaps/jar	All
188	Eye/Ear Ointments	cipro.drop	Ciprofloxacin Ear/Eye Drop	0.3% eye/ear drops	0.3%, 5ml vial	NAH/CVHs/D VHs
189	Eye/Ear Ointments	genta.drops	Gentamicin Eye/Ear Drops	0.3% solution	5ml vial	NAH/CVHs/D VHs
190	Eye/Ear Ointments	hydrocort.drops	Hydrocortisone Eye/Ear Drops	5ml/vial	5ml vial	NAH/CVHs/D VHs
191	Hemostatics	adenochrom.inj	Adenochrome Monosemitecarbazone Inj	5mg/ml	5ml vial	NAH/CVHs/D VHs

192	Hemostatics	botrop.inj	Botrophase Inj	1 IU/ml	2ml ampoule	NAH/CVHs/D VHs
193	Hemostatics	carbazoinj	Carbazochrome Salicylate Inj	50mg/ml	10ml vial	NAH/CVHs/D VHs
194	Hemostatics	etham.inj	Ethamsylate Inj	125mg/ml	125mg/ml, 2ml ampoule	NAH/CVHs/D VHs
195	Hormones	buser.inj	Busrelin Acetate Inj (Receptal)	0.004mg/ml	10ml vial	NAH/CVHs/D VHs/CFs/CAs
196	Hormones	clprost.inj	Cloprostenol Sodium (Synthetic Prostaglandin) Inj	250mcg/ml	2ml amp, 50amp/box	NAH/CVHs/D VHs/CFs/CAs
197	Hormones	clostenol.inj	Clostenol Inj	250mcg/ml	250mcg/ml, 2ml ampoule	NAH/CVHs/D VHs/CFs/CAs
198	Hormones	Folltrop.inj	FSH (Folltropin) Inj	20mg/ml	20mg/ml, 20ml vial	NAH/CVHs/D VHs/CFs/CAs
199	Hormones	hydroxyprogest.inj	Hydroxyprogesterone Caproate Inj	250mg/ml	250mg/ml, 2ml ampoule	NAH/CVHs/D VHs/CFs/CAs
200	Hormones	progest.insert	Intravaginal Progesterone Releasing Inserts	1.38gm progesterone	1.38gm (CIDR-B/TRIU-B)	NAH/CVHs/D VHs/CFs/CAs
201	Hormones	medroxy.inj	Medroxy Progesterone Inj	150mg/ml	150mg ampoule	NAH/CVHs/D VHs/CFs/CAs
202	Hormones	medroxy.tab	Medroxy Progesterone Tab	10mg/tab	10mg tab, 10 tab/strip	NAH/CVHs/D VHs/CFs/CAs
203	Hormones	oestra.inj	Oestradiol Benzoate Inj (CIDRIOL)	0.5mg/ml	0.5mg/ml, 50ml vial	NAH/CVHs/D VHs/CFs/CAs
204	Hormones	oestra.tab	Oestradiol Benzoate Tab (CIDRIOL)	10cap/box	10caps/box	NAH/CVHs/D VHs/CFs/CAs
205	Hormones	oxytoc.inj	Oxytocin Inj	5 IU/ml	1ml ampoule	All
206	Hormones	pgestrumate.inj	PG (Estrumate) Inj	20mg/ml	20mg/ml, 20ml vial	NAH/CVHs/D VHs/CFs/CAs
207	Hormones	pg600.inj	PG600 Inj	400 IU/ml	400 IU, 1 dose vial	NAH/CVHs/D VHs/CFs/CAs

208	Hormones	prostat2.inj	Prostaglandin F2 Alpha Inj (Natural)	5mg/ml	5mg/ml, 5ml vial	NAH/CVHs/D VHs/CFs/CAAs
209	Infusion Fluids	calmag.infus	Calcium Borogluconate Inj - 450ml bottle	Ca, Mg, P & Dextrose	450ml bottle	All
210	Infusion Fluids	dextrose10.infus	Dextrose Inj (10%D)	10% solution	10%, 500ml bottle	NAH/CVHs/D VHs/CFs/CAAs
211	Infusion Fluids	dextrose25.infus	Dextrose Inj (25%D)	25% solution	25%, 500ml bottle	NAH/CVHs/D VHs/CFs/CAAs
212	Infusion Fluids	dextrose5.infus	Dextrose Inj (5D)	5% solution	5%, 500ml bottle (5D)	All
213	Infusion Fluids	dextrosens.infus	Dextrose Normal Saline (DNS)	5% dextrose with NS	500ml bottle (DNS)	All
214	Infusion Fluids	norsal.infus	Normal Saline Inj (NS)	0.9% solution	500ml bottle (NS)	All
215	Infusion Fluids	ringer.infus	Ringers Lactate Inj (RL)	0.6gm NaCl	500ml bottle (RL)	All
216	Infusion Fluids	sodbicarb.infus	Sodium Bicarbonate Inj Intramammary	7.5% solution	7.5%, 25ml vial	All
217	Intramammary Infusions	cefopera.maminfus	Cefoperazone Sodium Intramammary	250mg/tube	250mg, 10ml tube	NAH/CVHs/D VHs/CFs/CAAs
218	Intramammary Infusions	cefuro.maminfus	Cefuroxime Sodium Intramammary	250mg/tube	250mg tube, 10ml tube	NAH/CVHs/D VHs/CFs/CAAs
219	Intramammary Infusions	cloxaampi.maminfus	Cloxacillin+Ampicillin Intrammary	200+75mg/tube	10ml tube	All
220	Intramammary Infusions	streptopen.maminfus	Strepto-penicillin Intramammary Infusion	6ml/tube	6ml tube	All
221	Intra-uterine Preparations	clotrimurea.pess	Clotrimazole with urea bolus (ORIPRIM)	I/uterine bolus	4 boli/strip	All
222	Intra-uterine Preparations	cotriurea.pess	Co-trimoxazole with urea bolus (ORIPRIM-U)	I/uterine bolus	4 boli/strip	All
223	Intra-uterine Preparations	nitrourea.pess	Nitrofurazone+Urea+Me tronidazole Bolus	60mg+6g+1000 mg/bolus	4 boli/strip	All
224	Intra-uterine Preparations	nitroureapovi.pess	Nitrofurazone+Urea+Me tronidazole+Pov. Iodine Bolus	60mg+6g+1000 mg+50mg/bolus	4 boli/strip	All



225	Intra-uterine Preparations	trisulphmethothurea,pe ss	Trimethoprim+ Sulpha methazole+Urea Bolus	0.1gm+0.5gm+ 6gm/bolus	4 boli/strip	All
226	Local/General Anesthetics	ligno.inj	Lignocaine Hcl Inj	2% solution	2% Solution, 30ml vial	All
227	Minerals	butacyan.inj	Butaphosphan+Cyanoco balamin Inj (Phosphorus inj)	100mg+50mcg/ ml	30ml vial	NAH/CVHs/D VHs/CFs/CAs
228	Minerals	calglu.inj	Calcium Gluconate Inj	10% solution	10%, 10ml bottle	NAH/CVHs/D VHs/CFs/CAs
229	Minerals	vsofat.pow	Feed Supplement (Vsofat Plus)	1kg/pkt	1kg packet	All
230	Minerals	inorghos.inj	Inorganic Phosphorous Inj - 30ml vial	79.4mg Sod. Acid Phosphate	30ml vial	All
231	Minerals	fevit-supplement	Iron and Vitamin B Supplement for piglets	100mgFe+1mg B6+50mgB12/ ml	10ml bottle	CFs/CAs
232	Minerals	irondext.inj	Iron Dextran Inj	50mg/ml	50mg/ml, 2ml ampoule	NAH/CVHs/D VHs/CFs/CAs
233	Minerals	minmix.pow	Mineral Mixture Powder (Minmix)	1kg/pkt	1kg packet	All
234	Minerals	minsupple.pow	Mineral Supplement Powder (Multimin)	1kg/pkt	1kg packet	All
235	Minerals	minsupple.tab	Mineral Supplement/Multimin Bolus (Co/Cu/Mn/Fe/Zn)	2gm bolus	2gm bolus, 4 boli/strip	All
236	Minerals	orghos.inj	Organic Phosphorous Inj	0.2gm/ml	0.2gm/ml, 20 ml vial	All
237	Minerals	sodphos.inj	Sodium Phosphate Inj (PHOS VSOL 40)	10ml/vial	10ml vial	NAH/CVHs/D VHs/CFs/CAs
238	Minerals	yeast.bolus	Yeast Extract+FeSo4+CuSo4+ Vit B+Lactic acid Bolus	300mg+50mg+ 20mcg	4 boli/strip	All

239	Miscellaneous	dist. amp	Distilled Water	5ml in 1 ampoule	5ml, 50 ampoules/packet	All
240	Psychotropic Drugs	acepro.inj	Acepromazine Inj	10mg/ml	20ml vial	NAH/CVHs/D VHS
241	Psychotropic Drugs	acepro.tab	Acepromazine Tab	25mg/tab	500 tab/jar	NAH/CVHs/D VHS
242	Psychotropic Drugs	chlpro.promo.tab	Chlorpromazine Hcl Tab	200mg/tab	200mg tab, 10 tab/strip	NAH/CVHs/D VHS
243	Rumenototics/Stomachics	antimomy.bolus	Antimomy K. Tartrate+FeSo4+CuSo4+Co Bolus	2g+2g+50mg+100mg/bolus	4 boli/strip	LECs/RNRECs /CFs
244	Rumenototics/Stomachics	rumenotoherb.pow	Rumenototic/Stomachic Powder (DIGESTOVET)	Herbal	1kg packet	LECs/RNRECs /CFs
245	Sedatives/Tranquilizers	ketamine.inj	Ketamine Inj	50mg/ml	50mg/ml, 10ml vial	NAH/CVHs/D VHS
246	Sedatives/Tranquilizers	methadone.inj	Methadone Hcl Inj	20ml/vial	20ml	NAH/CVHs/D VHS
247	Sedatives/Tranquilizers	triflu.inj	Triflupromazine Inj	20mg/ml	20mg/ml, 5ml vial	All
248	Sedatives/Tranquilizers	xylazine.inj	Xylazine Hcl Inj	20mg/ml	20mg/ml, 30ml vial	All
249	Steroids	dexa2.ml.inj	Dexamethazone Sodium Phosphate Inj - 2ml	4mg/ml	4mg/ml, 2ml vial	NAH/CVHs/D VHS
250	Steroids	dexa5.ml.inj	Dexamethazone Sodium Phosphate Inj - 5ml	4mg/ml	4mg/ml, 5ml vial	NAH/CVHs/D VHS
251	Steroids	isopre.inj	Isoflupredone Acetate Inj	2mg/ml	2mg/ml, 10ml vial	NAH/CVHs/D VHS
252	Steroids	predni.inj	Prednisolone Acetate Inj	1% solution	1% solution, 10ml vial	All
253	Steroids	predni.tab	Prednisolone Tab	5mg/tab	5mg tab, 10 tab/strip	All
254	Steroids	triamacc.inj	Triamcinolone Acetonide Inj	6mg/ml	6mg/ml, 5ml vial	NAH/CVHs/D VHS

255	Toxoids and Anti-toxins	antitox.inj	Tetanus Anti-toxin Inj	1500 IU/vial	1500 IU/vial	NAH/CVHs/D VHs
256	Toxoids and Anti-toxins	tetoxid.inj	Tetanus Toxoid Inj	0.5/1ml ampoule	0.5ml/1ml ampoule	NAH/CVHs/D VHs
257	Vaccines	arv.vac	Anti-rabies vaccine	Inactivated rabies antigen vial	10 doses, 10ml vial	All
258	Vaccines	cdparvo.vac	DHPPI+Leptospira vaccine	Freeze dried	1 ml dose vial with diluents	NAH/CVHs/D VHs
259	Vaccines	fmdv.vac	FMD vaccine	Inactivated, Strain O, A, Asia1	100 ml	All
260	Vaccines	fpox.vac	Fowl pox vaccine	Freeze dried pellet form	1000 doses vial	All
261	Vaccines	hsbq.vac	HS & BQ combined vaccine	Gel vaccine	90 ml	All
262	Vaccines	ibd.v.vac	Infectious bursal disease vaccine (IBD)	IBD intermediate strain	6 ml (200 doses)	All
263	Vaccines	mareks.vac	Mareks disease vaccine (HVT strain)	FC-126 strain	1000 doses vials	All
264	Vaccines	ndvr2b.vac	Newcastle disease vaccine (R2B)	Mukteshwar strain of NDV vial	100 & 200 doses, vial	All
265	Vaccines	ndvb1.vac	Newcastle disease vaccine (B1)	B1 strain of NDV vial	6 ml (200doses) vial	All
266	Vaccines	pprv.vac	PPR vaccine	Sungri,96 Strain	25/50 doses	CFs/CAs
267	Vaccines	anthrax.vac	Anthrax spore vaccine	10million spore/ml	25 & 50ml vial	All
268	Vaccines	csfv.vac	Classical swine fever vaccine	Lapinised strain	10ml vial	CFs/CAs
269	Vaccines	ecolioral.vac	E.coli oral vaccine	Culture of diff. E.coli strains	200ml vial	CFs/CAs
270	Vitamins	bcompl.inj	B-complex with liver extract Inj	Vitamins	10ml vial	All

271	Vitamins		methvit.inj	Methylcobalamin + Vit B6 Inj (Neurovet/Neuroxin)	500mcg+50mg/ml	10ml vial	NAH/CVHs/D VHS
272	Vitamins		vitaminA.inj	Vitamin A Inj	600000 IU/2ml	2ml ampoule	NAH/CVHs/D VHS/CFs/CAs
273	Vitamins		vitAB2D3K.pow	Vitamin AB2D3K Powder	1kg/pkt	1kg.jar/packet	All
274	Vitamins		vitA-D3.pow	Vitamin A-D3 Powder	1kg/pkt	1kg.packet	All
275	Vitamins		vitB12.inj	Vitamin B12 Inj (Cyanocobalamin)	Cyanocobalamin 100mcg/ml	100ml bottle	NAH/CVHs/D VHS
276	Vitamins		vitBcomplex.inj	Vitamin B-complex IV Injectable	10ml/vial	10ml vial	NAH/CVHs/D VHS
277	Vitamins		vitK.inj	Vitamin K Inj	10mg/ml	10mg/ml, 1ml ampoule	NAH/CVHs/D VHS/CFs/CAs
	Vitamins		vitwithAA.pow	Vitamins with Amino Acids Powder	1kg/pkt	1kg packet/jar	All

**Note:**

All = NAH/CVHs/DVHs/CFs/CAs/LECs/RNRECs/Non-departmental Agencies/NGOs

NAH = National Animal Hospital

CVHs = City Veterinary Hospitals

DVHs = District Veterinary Hospitals

LECs = Livestock Extension Centers

RNRECs = Renewable Natural Resources – Extension Centers

CFs = Central Farms

CAs = Central Agencies under Department of Livestock

**ESSENTIAL VETERINARY DRUG LIST 2016**  
**B: Categorization of Veterinary Equipment and non-drug items at different Animal Health Facilities**

SN	Equipment Type	Sub-type	Equipment Code	Name of the Equipment	Specifications	AH Facilities
1	Absorbents & Adhesives	Absorbents	pad.absorb	Absorbant Pad	57X37cm, 60pc/box	NAH/CVHs/DVHs
2	Absorbents & Adhesives	Absorbents	gauze.absorb	Absorbant/Surgical Gauze	1 piece/pkt	NAH/CVHs/DVHs
3	Absorbents & Adhesives	Absorbents	drape.absorb	Buster Surgical Drape	Large, 1pc/pkt	NAH/CVHs/DVHs
4	Absorbents & Adhesives	Absorbents	cotton400.absorb	Cotton - Absorbent, 400gm gross/250gm net	400gm gross/250gm net	All
5	Absorbents & Adhesives	Adhesives	tape7.5.adhesiv	Addhesive Tape - 7.5cm	7.5cm	All
6	Absorbents & Adhesives	Adhesives	bandgel10.adhesiv	Bandage - 10cm	10cm, 12pc/pkt	All
7	Absorbents & Adhesives	Adhesives	bandgel15.adhesiv	Bandage - 15cm	15cm, 12pc/pkt	All
8	Absorbents & Adhesives	Adhesives	bandge5.adhesiv	Bandage - 5cm	5cm, 12pc/pkt	All
9	Absorbents & Adhesives	Adhesives	bandge7.5.adhesiv	Bandage - 7.5cm	7.5cm, 12pc/pkt	All
10	Absorbents & Adhesives	Adhesives	crepe10.adhesiv	Cotton Crepe Bandage - 10X4m	10X4m stretched length	NAH/CVHs/DVHs
11	Absorbents & Adhesives	Adhesives	crepe5.adhesiv	Cotton Crepe Bandage - 5X4m	5X4m stretched length	NAH/CVHs/DVHs
12	Absorbents & Adhesives	Adhesives	crepe7.5.adhesiv	Cotton Crepe Bandage - 7.5X4m	7.5X4m stretched length	NAH/CVHs/DVHs
13	Absorbents & Adhesives	Adhesives	elastic10.adhesiv	Elastic Adhesive Bandage - 10cmX4/6	10cmX4/6 stretched length	NAH/CVHs/DVHs
14	Absorbents & Adhesives	Adhesives	elastic8.adhesiv	Elastic Adhesive Bandage -8cmX4/6	8cmX4/6 stretched length	NAH/CVHs/DVHs

15	Absorbents & Adhesives	Adhesives	cohesive10.adhesisv	Flexible Cohesive Bandage - 10X45cm	10X45cm roll	NAH/CVHs/DVHs
16	Absorbents & Adhesives	Adhesives	cohesive10kru.adhesisv	Flexible Cohesive Bandage - 10X45cm, Kruuse	10X45cm, Kruuse, 10/pkt	NAH/CVHs/DVHs
17	Absorbents & Adhesives	Adhesives	cohesive15.adhesisv	Flexible Cohesive Bandage - 15X45cm	15X45cm roll	NAH/CVHs/DVHs
18	Absorbents & Adhesives	Adhesives	cohesive5.adhesisv	Flexible Cohesive Bandage - 5X45cm	5X45cm roll	NAH/CVHs/DVHs
19	Absorbents & Adhesives	Adhesives	cohesive7.5.adhesisv	Flexible Cohesive Bandage - 7.5X45cm	7.5X45cm roll	NAH/CVHs/DVHs
20	Absorbents & Adhesives	Adhesives	pop7.5bndg.adhesisv	Plaster of Paris Bandage - 7.5cm	7.5cm	All
21	Common Surgical Instruments	Forceps/Clamps	allies14.forceps	Allies Forcep - 14cm	SS, 14cm	All
22	Common Surgical Instruments	Forceps/Clamps	allies15.forceps	Allies Forcep - 15cm	SS, 15cm	All
23	Common Surgical Instruments	Forceps/Clamps	artcur14.forceps	Artery Forcep - 14cm Curved	14cm, Curved	All
24	Common Surgical Instruments	Forceps/Clamps	artstrgt14.forceps	Artery Forcep - 14cm Straight	14cm, Straight	All
25	Common Surgical Instruments	Forceps/Clamps	artcur18cov.forceps	Artery Forcep - 18cm Covered & Curved	18cm, Covered, Curved	All
26	Common Surgical Instruments	Forceps/Clamps	artstrgt18cov.forceps	Artery Forcep - 18cm Covered & Straight	18cm, Covered, Straight	All
27	Common Surgical Instruments	Forceps/Clamps	artcur18.forceps	Artery Forcep - 18cm Curved	18cm, Curved	All
28	Common Surgical Instruments	Forceps/Clamps	art18strgt.forceps	Artery Forcep - 18cm Straight	18cm, Straight	All
29	Common Surgical Instruments	Forceps/Clamps	art5instrgt.forceps	Artery Forcep - 5 inch Straight & Imported	5 inch, Straight, Imported	All
30	Common Surgical Instruments	Forceps/Clamps	art5incur.forceps	Artery Forcep - 6 inch Curved & Imported	6 inch, Curved, Imported	All
31	Common Surgical Instruments	Forceps/Clamps	carm15cur.forceps	Carmalt Forceps - 15cm	15cm, Curved	NAH/CVHs/DVHs

	Instruments	Forceps/Clamps			Curved		SS, Piece	NAH/CVHs/DVHs
32	Common Surgical Instruments	Forceps/Clamps	cheetles.forceps		Cheetles Forceps		SS, Piece	NAH/CVHs/DVHs
33	Common Surgical Instruments	Forceps/Clamps	rattooth.forceps		Dissecting Forceps - Rat-toothed		Rat-toothed, 8"	All
34	Common Surgical Instruments	Forceps/Clamps	ana13dissec.forceps		Dissecting Forceps - 13cm Anatomic		SS, 13cm, Anatomic	All
35	Common Surgical Instruments	Forceps/Clamps	drss14teeth.forceps		Dressing Forceps with teeth		SS, 14cm	All
36	Common Surgical Instruments	Forceps/Clamps	croc8.forceps		Ear Forceps - Crocodile		Crocodile, SS, 8cm	All
37	Common Surgical Instruments	Forceps/Clamps	earpoly17.forceps		Ear Polyplus Forceps		17cm, With grooves	All
38	Common Surgical Instruments	Forceps/Clamps	ints23cur.forceps		Intestinal Forcep - 23cm Curved		23cm, Curved	All
39	Common Surgical Instruments	Forceps/Clamps	ints23strgt.forceps		Intestinal Forcep - 23cm Straight		23cm, Straight	All
40	Common Surgical Instruments	Forceps/Clamps	stom9cur.clamp		Stomach Clamp (Doyen's type) - 9", Curved		Doyen's type, 9", Curved	NAH/CVHs/DVHs
41	Common Surgical Instruments	Forceps/Clamps	stom9strgt.clamp		Stomach Clamp (Doyen's type) - 9", Straight		Doyen's type, 9", Straight	NAH/CVHs/DVHs
42	Common Surgical Instruments	Forceps/Clamps	thrtcur.forceps		Throat Forceps - Long & Curved		Long, Curved	All
43	Common Surgical Instruments	Forceps/Clamps	thum14.forceps		Thumb Forceps - 14cm		SS, 14cm	All
44	Common Surgical Instruments	Forceps/Clamps	tissue6.forceps		Tissue Forceps with teeth - 6 inch		SS, 6"	All
45	Common Surgical Instruments	Forceps/Clamps	tongue.forceps		Tongue forceps		SS, Piece	All
46	Common Surgical Instruments	Forceps/Clamps	towel17.clamp		Towel Clamps - 17cm		SS, 17cm	All
47	Common Surgical Instruments	Forceps/Clamps	towel9.clamp		Towel Clamps - 9cm		SS, 9cm	All

48	Common Surgical Instruments	Forceps/Clamps	uterus.forceps	Uterus Forceps (Pauls)	SS, Large, Pauls	All
49	Common Surgical Instruments	Scissors & Blades	bphandlbp.blade	B.P. Blade Handle - Baird Parker	Baird Parker, Piece	All
50	Common Surgical Instruments	Scissors & Blades	bphandl3.blade	B.P. Blade Handle No. 3	No. 3, Piece	All
51	Common Surgical Instruments	Scissors & Blades	bphandl4.blade	B.P. Blade Handle No. 4	No. 4, Piece	All
52	Common Surgical Instruments	Scissors & Blades	bpblid20.blade	B.P. Blade No. 20	No. 20, 100pc/pkt	All
53	Common Surgical Instruments	Scissors & Blades	bpblid21.blade	B.P. Blade No. 21	No. 21, 100pc/pkt	All
54	Common Surgical Instruments	Scissors & Blades	bpblid22.blade	B.P. Blade No. 22	No. 22, 100pc/pkt	All
55	Common Surgical Instruments	Scissors & Blades	bpblid23.blade	B.P. Blade No. 23	No. 23, 100pc/pkt	All
56	Common Surgical Instruments	Scissors & Blades	bpblid24.blade	B.P. Blade No. 24	No. 24, 100pc/pkt	All
57	Common Surgical Instruments	Scissors & Blades	bpblid4.blade	B.P. Blade No. 4	No. 4, 100pc/pkt	All
58	Common Surgical Instruments	Scissors & Blades	bpblid11.blade	B.P. Blade No. 11	No. 11, 100pc/pkt	All
59	Common Surgical Instruments	Scissors & Blades	bpblid12.blade	B.P. Blade No. 12	No. 12, 100pc/pkt	All
60	Common Surgical Instruments	Scissors & Blades	bpblid15.blade	B.P. Blade No. 15	No. 15, 100pc/pkt	All
61	Common Surgical Instruments	Scissors & Blades	bpblid25.blade	B.P. Blade No. 25	No. 25, 100pc/pkt	All
62	Common Surgical Instruments	Scissors & Blades	dress14ang.scis	Dressing Scissors - 14cm Angular	14cm, Angular	All
63	Common Surgical Instruments	Scissors & Blades	dress14cur.scis	Dressing Scissors - 14cm Curved	14cm, Curved	All
64	Common Surgical Instruments	Scissors & Blades	dress14strgt.scis	Dressing Scissors - 14cm	14cm, Straight	All





81	Common Surgical Instruments	Scissors & Blades	shpbluscil14strgt.scis	Scissors - 14cm, Sharp cum Blunt, Straight	14cm, Sharp cum Blunt, Straight	All
82	Common Surgical Instruments	Scissors & Blades	scil17ang.scis	Scissors - 17cm, Angular	17cm, Angular	All
83	Common Surgical Instruments	Scissors & Blades	bluscil17cur.scis	Scissors - 17cm, Blunt, Curved	17cm, Blunt, Curved	All
84	Common Surgical Instruments	Scissors & Blades	bluscil17strgt.scis	Scissors - 17cm, Blunt, Straight	17cm, Blunt, Straight	All
85	Common Surgical Instruments	Scissors & Blades	mayo17cur.scis	Scissors - 17cm, Mayo's type, Curved	17cm, Mayo's type, Curved	All
86	Common Surgical Instruments	Scissors & Blades	mayo17strgt.scis	Scissors - 17cm, Mayo's type, Straight	17cm, Mayo's type, Straight	All
87	Common Surgical Instruments	Scissors & Blades	poiscil17cur.scis	Scissors - 17cm, Pointed, Curved	17cm, Pointed, Curved	All
88	Common Surgical Instruments	Scissors & Blades	poiscil17strgt.scis	Scissors - 17cm, Pointed, Straight	17cm, Pointed, Straight	All
89	Common Surgical Instruments	Scissors & Blades	shpbluscil17cur.scis	Scissors - 17cm, Sharp cum Blunt, Curved	17cm, Sharp cum Blunt, Curved	All
90	Common Surgical Instruments	Scissors & Blades	shpbluscil17strgt.scis	Scissors - 17cm, Sharp cum Blunt, Straight	17cm, Sharp cum Blunt, Straight	All
91	Common Surgical Instruments	Scissors & Blades	suture12.scis	Suture Scissors - 12cm	SS, 12cm	All
92	Common Surgical Instruments	Surgical Equipment	cmetalflat.surg	C-metal Burner (Flat)	5cm, Flat	NAH/CVHs/DVHs
93	Common Surgical Instruments	Surgical Equipment	cmetalpoint.surg	C-metal Burner (Pointed)	5cm, Pointed	NAH/CVHs/DVHs
94	Common Surgical Instruments	Surgical Equipment	cmetalball.surg	C-metal Burner (Ball)	5cm, Ball	NAH/CVHs/DVHs
95	Common Surgical Instruments	Surgical Equipment	dissecfish.surg	Dissecting Set for Fish	14 instrument set for Fish	CFs/CAs
96	Common Surgical Instruments	Surgical Equipment	electcau.surg	Electric Cautey	Engell 80w, Kruuse	All
97	Common Surgical Instruments	Surgical Equipment	fishdissec.surg	Fish Dissecting kit	Ipc/set	CFs/CAs

	Instruments	Equipment					
98	Common Surgical Instruments	Surgical Equipment	oplight220.surg	Operating Light - 100-250cm, 220v	100-250cm, 220v	NAH/CVHs/DVHs	
99	Common Surgical Instruments	Surgical Equipment	pockset.surg	Pocket Surgical Set	Kruise, 1 set	NAH/CVHs/DVHs	
100	Common Surgical Instruments	Surgical Equipment	rumen.surg	Rumenotomy Set	Ifixation frame/8fixation tenaculated/2valsullon forceps	NAH/CVHs/DVHs	
101	Common Surgical Instruments	Surgical Equipment	largeami.surgiset	Surgical Set (For major surgical surgeries in large animals)	Surgical set containing 37 instruments	NAH/CVHs/DVHs	
102	Common Surgical Instruments	Surgical Equipment	smallami.surgiset	Surgical Set (For ovario-hysterectomy and castration in small animals)	Surgical set containing 23 instruments	NAH/CVHs/DVHs	
103	Containers & Vials	Containers	buck10.cont	Bucket - 10L	10L, Piece	All	
104	Containers & Vials	Containers	cbox10.cont	Cool Box (10L with side locking)	10L cap with side locking	All	
105	Containers & Vials	Containers	cbox15strap.cont	Cool Box (15L with shoulder strap)	15L cap, With shoulder strap	All	
106	Containers & Vials	Containers	cbox20withlock.cont	Cool box (20L with side locking)	20L cap with side locking	All	
107	Containers & Vials	Containers	cbox20.cont	Cool Box (20L without shoulder strap)	20L cap, Without shoulder strap	All	
108	Containers & Vials	Containers	cbox5.cont	Cool box (5L)	5 Ltrs	All	
109	Containers & Vials	Containers	cbox5labfr.cont	Cool box (5L from Labfreeze)	5L cap, Labfreeze	All	
110	Containers & Vials	Containers	cboxbig.cont	Cool Box - Big	Big	All	
111	Containers & Vials	Containers	cboxlarge.cont	Cool Box - Large	Large	All	
112	Containers & Vials	Containers	cboxmed.cont	Cool Box - Medium	Medium	All	
113	Containers & Vials	Containers	cboxsmall.cont	Cool Box - Small	Small	All	
114	Containers & Vials	Containers	douche.cont	Douche Can	Aluminium with pipe and pump	All	

115	Containers & Vials	Containers	dressdrum.cont	Dressing Drum	SS, 2 tier	NAH/CVHs/DVHs
116	Containers & Vials	Containers	icepck.cont	Ice Packs	Gel pack	All
117	Containers & Vials	Containers	kidtray10.cont	Kidney Tray - 10 inch	SS, 10", Small	All
118	Containers & Vials	Containers	kidtray12.cont	Kidney Tray - 12 inch	SS, 12", Big	All
119	Containers & Vials	Containers	meayc100.cont	Measuring Cylinder - 100ml	Plastic, 100ml	All
120	Containers & Vials	Containers	meayc120.cont	Measuring Cylinder - 120ml	Plastic, 120ml	All
121	Containers & Vials	Containers	meajar125.cont	Measuring Jar - 125ml	125ml, Tarsons	All
122	Containers & Vials	Containers	meajar235.cont	Measuring Jar - 235ml	235ml, Tarsons	All
123	Containers & Vials	Containers	meajar30.cont	Measuring Jar - 30ml	30ml cap with cap, Tarsons	All
124	Containers & Vials	Containers	specijar.cont	Specimen Jar	Plastic, 31X50mm	NAH, CVHs, DVHs, CFs, CAs
125	Containers & Vials	Containers	spraybot.cont	Spray Bottle with noozle	50ml bottle with noozle	NAH, CVHs, DVHs, CFs, CAs
126	Containers & Vials	Containers	bow/big.cont	Steel Bowl/Basin - Big	SS, Big	All
127	Containers & Vials	Containers	bow/med.cont	Steel Bowl/Basin - Medium	SS, Medium	All
128	Containers & Vials	Containers	stray12.cont	Surgical Tray - 12 inch	SS, 12", Big	All
129	Containers & Vials	Containers	stray/lid.cont	Surgical Tray - With Lid	SS, With Lid	All
130	Containers & Vials	Containers	vacmedcarr.cont	Vaccine Carrier - 10-18L, Medium	10-18L, Medium	NAH, CVHs, DVHs, CFs, CAs
131	Containers & Vials	Containers	vaclarearr.cont	Vaccine Carrier - 30-40L, Large	30-40L, Large	NAH, CVHs, DVHs, CFs, CAs
132	Containers & Vials	Containers	vaccolbox.cont	Vaccine Cold Chain Box - 5-10L, Insulated	5-10L, Insulated	NAH, CVHs, DVHs, CFs, CAs
133	Containers & Vials	Vials	ediavac.vial	EDTA Vacutainer - 2ml tube	2ml, 100tubes/pkt	NAH, CVHs, DVHs, CFs, CAs
134	Containers & Vials	Vials	serum.vial	Plain Vacutainer for serum	6ml/7ml, For serum	NAH, CVHs, DVHs, CFs, CAs
135	Containers & Vials	Vials	scintill20.vial	Scintillation Vials for fecal sample	For fecal sample, 20ml	All

136	Containers & Vials	Containers	ref4vaec.cont	Vaccine Refrigerator - 110-130L, Labfreeeze	110-130L, Labfreeeze	All
137	Containers & Vials	Containers	needl2used.cont	Container for used needles	For used blades, needles and other sharp objects, 2 litre capacity	NAH, CVHs, DVHs, CFs, CAs
138	Dental Instrument	Dental Equip	scaler.dental	Dental Scaler	Electric ultrasonic scaler with LCD display, 3 scaler tips	NAH/CVHs/DVHs
139	Dental Instrument	Dental Equip	extract.dental	Tooth Extractor	SS, Piece	NAH/CVHs/DVHs
140	Dental Instrument	Dental Equip	rasptooth.dental	Tooth Rasp for equine	SS, Set for equine	NAH/CVHs/DVHs
141	Diagnostic/Clinical Equipment	Clinical	anistretch.clinic	Animal Stretcher	60X120cm, 2 straps with 2 wheels	NAH/CVHs/DVHs
142	Diagnostic/Clinical Equipment	Clinical	bltrans.clinic	Blood Transfusion Kit	400ml packet	NAH/CVHs/DVHs
143	Diagnostic/Clinical Equipment	Clinical	boldrnch.clinic	Bolus Drenching Gun - Imported	50 nos/box	NAH/CVHs/DVHs
144	Diagnostic/Clinical Equipment	Clinical	thermhicks.clinic	Clinical Thermometer (Hicks)	Clinical, Mercury, Hicks	All
145	Diagnostic/Clinical Equipment	Clinical	clipla.clinic	Clipper (Large animals)	250watts with blade no. 60	NAH/CVHs/DVHs
146	Diagnostic/Clinical Equipment	Clinical	clipsa.clinic	Clipper (Small animals)	100watts with blade no. 22	NAH/CVHs/DVHs
147	Diagnostic/Clinical Equipment	Clinical	thermdigimp.clinic	Digital Imported Thermometer	Digital, Imported	All
148	Diagnostic/Clinical Equipment	Clinical	thermdigind.clinic	Digital Indian Thermometer	Digital, Indian	All
149	Diagnostic/Clinical Equipment	Clinical	earcleansyr.clinic	Ear Cleaning Syringe (Russka)	Russka, 160ml, Rubber	NAH/CVHs/DVHs
150	Diagnostic/Clinical Equipment	Clinical	ivset.clinic	IV Set	Disposable, Set	All
151	Diagnostic/Clinical Equipment	Clinical	ivstand.clinic	IV Stand	Strong tubular with cast iron base	All

152	Diagnostic/Clinical Equipment	Clinical	laryng.clinic	Laryngoscope	Fibre-optic	NAH/CVHs/DVHs
153	Diagnostic/Clinical Equipment	Clinical	orlrdmgun.clinic	Oral Drenching Gun	Pour-on, 20ml	NAH/CVHs/DVHs
154	Diagnostic/Clinical Equipment	Clinical	ambubag.clinic	Silicone Resuscitator (Ambu Bag)	Ambu Bag	NAH/CVHs/DVHs
155	Diagnostic/Clinical Equipment	Clinical	stethstd.clinic	Stethoscope - Standard	Standard	All
156	Diagnostic/Clinical Equipment	Clinical	stehimp.clinic	Stethoscope - Imported	Imported	NAH/CVHs/DVHs
157	Diagnostic/Clinical Equipment	Clinical	tabintro.clinic	Tablet Introducer - For small animals	For small animals, Plastic	NAH/CVHs/DVHs
158	Diagnostic/Clinical Equipment	Clinical	thermrefrig.clinic	Thermometer for refrigerator	For Refrigerator	All
159	Diagnostic/Clinical Equipment	Clinical	thermroom.clinic	Thermometer for room temperature	For measuring room temp.	All
160	Diagnostic/Clinical Equipment	Clinical	thermwater.clinic	Thermometer for water temperature	For recording water temp.	All
161	Diagnostic/Clinical Equipment	Clinical	vgspec12.clinic	Vaginal Speculum - 12inch	12" for large animals	NAH/CVHs/DVHs
162	Diagnostic/Clinical Equipment	Clinical	vgspec6.clinic	Vaginal Speculum - 6inch	6" for small animals	NAH/CVHs/DVHs
163	Diagnostic/Clinical Equipment	Clinical	vgspecpol.clinic	Vaginal Speculum (Polanky's Improved)	Polanky's Improved, 11"	NAH/CVHs/DVHs
164	Diagnostic/Clinical Equipment	Diagnostics	datalogger.diag	Data Logger	UX100 Temp/RH, Hobo	NAH, CVHs, DVHs, CFs, CAs
165	Diagnostic/Clinical Equipment	Diagnostics	aidetect.diag	Heat/AI Detection Tool (Ranscope)	Fern pattern detector	NAH, CVHs, DVHs, CFs, CAs
166	Diagnostic/Clinical Equipment	Diagnostics	cmkit500.diag	Mastitis Detection Kit (CMT-Test)	500ml reagent with paddle	NAH, CVHs, DVHs, CFs, CAs
167	Diagnostic/Clinical Equipment	Diagnostics	masticheck100.diag	Mastitis Detection Kit (Masticheck)	100mlX4 reagent with paddle	NAH, CVHs, DVHs, CFs, CAs
168	Diagnostic/Clinical Equipment	Diagnostics	bpmonitor.diag	Sphygmomanometer	Digital,	NAH/CVHs/DVHs

169	Equipment Diagnostic/Clinical Equipment	Diagnostics	ultrasound.diag	(Digital BP monitor) Ultrasound Scanner Machine	22mmX40mm Veterinary USG	NAH/CVHs/DVHs
170	Diagnostic/Clinical Equipment	Diagnostics	xraydevelop.diag	X-Ray Developer	NA	NAH/CVHs/DVHs
171	Diagnostic/Clinical Equipment	Diagnostics	xrayfilm.diag	X-Ray Film	15" x 12	NAH/CVHs/DVHs
172	Diagnostic/Clinical Equipment	Diagnostics	xrayfixer.diag	X-Ray Fixer	NA	NAH/CVHs/DVHs
173	Diagnostic/Clinical Equipment	Diagnostics	xraymachine.diag	X-Ray Machine (Portable)	Portable, PX-100HF, EcoRay	NAH/CVHs/DVHs
174	Diagnostic/Clinical Equipment	Diagnostics	bloodana.diag	Blood Analyzer for Veterinary Practice	Automatic, color LCD touch-screen for analyzing complete blood count	NAH, CVHs, RLDCs, NCAH
175	Diagnostic/Clinical Equipment	Diagnostics	biochemana.diag	Biochemistry Analyzer	Automatic, run multiple samples (15 nos) with capacity to analyze more than 30 blood chemistry test parameters	NCAH, NAH
176	Diagnostic/Clinical Equipment	Clinical	tonomet.clinic	Tonometer	Type: TV01, For Veterinary use only	NAH/CVHs/DVHs
177	Diagnostic/Clinical Equipment	Clinical	groomdry.clinic	Grooming dryer	Electric operated, for small animals with one hoses	NAH/CVHs/DVHs
178	Diagnostic/Clinical Equipment	Clinical	laserm.clinic	Laser Therapy Machine	Laser type Class IV with wavelength: 980nm	NAH/CVHs
179	Garments and Gloves	Garments	aprrplas.grmt	Apron (Plastic)	Plastic	All
180	Garments and Gloves	Garments	oprloop.grmt	Face/Operation Mask - 2 ply, Loop	2 ply, Loop, 100pc/box	All

181	Garments and Gloves	Garments	oprtric.grmt	Face/Operation Mask - 2 ply, Tie	2 ply, Tie, 100pc/box	All
182	Garments and Gloves	Garments	surgecap.grmt	Surgical Cap - Ambay	Ambay	NAH/CVHs/DVHs
183	Garments and Gloves	Garments	surgrngown.grmt	Surgical Green Gown	Cotton, Large & Medium	NAH/CVHs/DVHs
184	Garments and Gloves	Garments	whitcoat.grmt	White Coat/Apron	Pure cotton, Large & Medium	All
185	Garments and Gloves	Garments	clinedress.grmt	Clinical Dress/Clothing (Blue/Sky Blue)	Shirt with overlapping V-neck, short sleeves and trousers with elastic and cord in the waistband	NCAH, RLDCs, NAH, CVHs, DVHs
186	Garments and Gloves	Gloves	aigloves.glov	Disposable Gloves for AI - Plastic, AI type full	Plastic, AI type full	All
187	Garments and Gloves	Gloves	protgloves.glov	Protective Gloves - Leather, Kruuse	Leather, Kruuse	NAH/CVHs/DVHs
188	Garments and Gloves	Gloves	surglove6.glov	Surgical Gloves - Disposable, Size 6	Disposable, Size 6	All
189	Garments and Gloves	Gloves	surglove6.5.glov	Surgical Gloves - Disposable, Size 6.5	Disposable, Size 6.5	All
190	Garments and Gloves	Gloves	surglove7.glov	Surgical Gloves - Disposable, Size 7	Disposable, Size 7	All
191	Garments and Gloves	Gloves	surglove7.5.glov	Surgical Gloves - Disposable, Size 7.5	Disposable, Size 7.5	All
192	General Instruments	General Equip	absknife.sharp	Abscess Knife (Sharp)	SS, Sharp	NAH, CVHs, DVHs, CFs, CAs
193	General Instruments	General Equip	absknife.symes	Abscess Knife (Symes)	Symes	NAH, CVHs, DVHs, CFs, CAs
194	General Instruments	General Equip	knife6imp.autop	Autopsy Knife - 6 inch, Imported	6 inch, Imported	NAH, CVHs, DVHs, CFs, CAs
195	General Instruments	General Equip	brdzcast.large	Burdizzo Castrator for large animals	Large (For Cattle), Imported	All



196	General Instruments	General Equip	brdzcast.small	Burdizzo Castrator for small animals	Small (For sheep and goats)	All
197	General Instruments	General Equip	clamp.castrat	Castration Clamp for Horse	SS, For Horse	All
198	General Instruments	General Equip	vbocozy.emac	Emasculator (Verbocozy)	Verbocozy, Kruuse, Piece	All
199	General Instruments	General Equip	trocar.kruuse	Trocar and Canula (Kruuse)	Kruuse, Wooden/Rubber handle	All
200	General Instruments	General Equip	trocar.small	Trocar and Canula for small ruminants	SS, For small ruminants	All
201	General Instruments	General Equip	wnd.retract	Wound Retractor	SS, Large	NAH/CVHs/DVHs
202	Horn and Hoof Equipment	Hoof Equipment	cut41.imp.hoof	Hoof Cutter (Imported)	SS, 41cm, Imported	NAH, CVHs, DVHs, CFs, CAs
203	Horn and Hoof Equipment	Hoof Equipment	cut42.loc.hoof	Hoof Cutter (Local)	SS, 41cm, Local	NAH, CVHs, DVHs, CFs, CAs
204	Horn and Hoof Equipment	Hoof Equipment	nailecut.hoof	Nail cutter for Dogs and Cats	For Dogs and Cats, SS, Local	NAH/CVHs/DVHs
205	Horn and Hoof Equipment	Hoof Equipment	nailecutkru.hoof	Nail cutter for dogs (Kruuse)	For dogs, Imported, Kruuse	NAH/CVHs/DVHs
206	Horn and Hoof Equipment	Horn Equipment	dehorn.horn	Dehorner	Electrical type	All
207	Identification Equipment	Identification Equip	canhealthcard.ident	Canine Health Card	Booklet	All
208	Identification Equipment	Identification Equip	can.token.ident	Canine Token	Nos.	All
209	Identification Equipment	Identification Equip	dog.col.ident	Dog Collar	30 mtrs roll, Red color	All
210	Identification Equipment	Identification Equip	applitag.ident	Ear Tag Applicator	Allflex, Imported	CFs/CAs
211	Identification Equipment	Identification Equip	applitagdog.ident	Ear Tag Applicator for dog collar	Allflex, Imported	CFs/CAs

212	Identification Equipment	Identification Equip	eartagcattle.ident	Ear Tag for Cattle	Allflex, Yellow, Blank, Medium	CFs/CAs
213	Identification Equipment	Identification Equip	eartagssheep.ident	Ear Tag for Sheep	Allflex, Yellow, Blank, Small	CFs/CAs
214	Identification Equipment	Identification Equip	eartagpen.ident	Ear Tag Pen	Allflex, 2 in 1 tag pen	CFs/CAs
215	Miscellaneous	Miscellaneous	churner.misc	Butter Churner	Piece	CFs/CAs
216	Miscellaneous	Miscellaneous	mornpest.misc	Mortar and Pestle	Porcelain, 100mm diameter	All
217	Miscellaneous	Miscellaneous	sharpsteel.misc	Sharpening Steel	Imported	All
218	Miscellaneous	Miscellaneous	spilamp.misc	Spirit Lamp	Metallic	All
219	Miscellaneous	Miscellaneous	spraymach.misc	Spray Machine	Aspec, 12L, 37.5X18X51cm	All
220	Miscellaneous	Miscellaneous	stove.misc	Brass Stove	Brass with pump	All
221	Miscellaneous	Miscellaneous	dochbagbig.misc	Doctor's Bag - Big	Imported, Big	All
222	Miscellaneous	Miscellaneous	dochbagsmall.misc	Doctor's Bag - Small	Imported, Small	All
223	Miscellaneous	Miscellaneous	lthrbag.misc	Leather Bag	3chamber with multiple pouch, 8"X12"9 professional	All
224	Miscellaneous	Miscellaneous	ln2dip.misc	LN2 dip stick	SS, 3m, With graduation mark	All
225	Miscellaneous	Miscellaneous	pulley.misc	Pulley	For lifting large animals, 500kg	NAH, CVHs, DVHs, CFs, CAs
226	Obstretical Instruments	Obstetrics	dilatator.obstr	Cervix & Uterine Dilator - SS, 10pc/set	SS, 10pc/set	NAH/CVHs/DVHs
227	Obstretical Instruments	Obstetrics	dystsset.obstr	Dystocia Set	1 obstretic set, Vitco	NAH/CVHs/DVHs
228	Obstretical Instruments	Obstetrics	dystfor.obstr	Dystokia Forceps	SS, 29cm	NAH/CVHs/DVHs
229	Obstretical Instruments	Obstetrics	embrytime.obstr	Embryotome	Kruuse, Without wire	NAH/CVHs/DVHs
230	Obstretical Instruments	Obstetrics	embryknife.obstr	Embryotomy Knife	Sickle shaped with ring	NAH/CVHs/DVHs

231	Obstretical Instruments	Obstretics	hookmoses.obstr	Obstern Eye Hook - Moses Pattern	Moses Pattern, SS, 6x800mm	NAH/CVHs/DVHs
232	Obstretical Instruments	Obstretics	hookblunt.obstr	Obstretical Eye Hook - Blunt	Blunt, 12cm	NAH/CVHs/DVHs
233	Obstretical Instruments	Obstretics	hookpointed.obstr	Obstretical Eye Hook - Sharp	Sharp, 12cm	NAH/CVHs/DVHs
234	Obstretical Instruments	Obstretics	clampkruuse.obstr	Obstetric Clamp	With integrated handle, Kruuse	NAH/CVHs/DVHs
235	Obstretical Instruments	Obstretics	hookkrey.obstr	Obstetric Eye Hook - Krey Schottler's with ring	16cm, Krey Schottler, Sharp	NAH/CVHs/DVHs
236	Obstretical Instruments	Obstretics	ovalhysthkat.obstr	Ovario-hysterectomy Hook for cats	18cm, For cats	NAH/CVHs/DVHs
237	Obstretical Instruments	Obstretics	ovalhysthkdog.obstr	Ovario-hysterectomy Hook for dogs	20cm, For dogs	NAH/CVHs/DVHs
238	Obstretical Instruments	Prolapse Equipment	proclamp.obstr	Prolapse Clamp for cattle	For cattle, SS	NAH/CVHs/DVHs
239	Obstretical Instruments	Prolapse Equipment	prolpin.obstr	Prolapse Pin	Plastic, 55-77mm, 12pc/pkt	NAH/CVHs/DVHs
240	Obstretical Instruments	Prolapse Equipment	prolpininst.obstr	Prolapse Pin Insester	Kruuse	NAH/CVHs/DVHs
241	Ophthalmic Instrument	Ophthalmic Equip	eyecap.opthal	Eye Cap	Post-operative care for eye	NAH/CVHs/DVHs
242	Ophthalmic Instrument	Ophthalmic Equip	eydrfrpimp.opthal	Eye Dressing Forceps (Kruuse)	Kruuse, Imported	NAH/CVHs/DVHs
243	Ophthalmic Instrument	Ophthalmic Equip	eydrfrp3point.opthal	Eye Dressing Forceps with 3 hole handle	SS, 3 hole handle, Pointed	NAH/CVHs/DVHs
244	Ophthalmic Instrument	Ophthalmic Equip	eydrfrp16.opthal	Eye Dressing Forceps 16cm	SS, 16cm	NAH/CVHs/DVHs
245	Ophthalmic Instrument	Ophthalmic Equip	eyspec.opthal	Eye Speculum/Eye Elevator	SS, Wire type	NAH/CVHs/DVHs
246	Ophthalmic Instrument	Ophthalmic Equip	ophthalmos.opthal	Ophthalmoscope cum Otescope	Imported	NAH/CVHs/DVHs
247	Orthopaedic	Orthopaedic	ampsaw.ortho	Amputation Saw	SS, 9", teeth suitable	NAH/CVHs/DVHs

	Instrument											
248	Orthopaedic Instrument	Orthopaedic	bonchisel.ortho	Bone Chisel				for bone cutting				NAH/CVHs/DVHs
249	Orthopaedic Instrument	Orthopaedic	bonrasp.ortho	Bone Rasp								NAH/CVHs/DVHs
250	Orthopaedic Instrument	Orthopaedic	buspint.ortho	Buster Quick Splint								NAH/CVHs/DVHs
251	Orthopaedic Instrument	Orthopaedic	chiselhattac.ortho	Chisel and Attactome								NAH/CVHs/DVHs
252	Orthopaedic Instrument	Orthopaedic	popsciss.ortho	Plaster of Paris Scissors								All
253	Orthopaedic Instrument	Orthopaedic	plaweng.ortho	Plaster Saw Engel								NAH/CVHs/DVHs
254	Orthopaedic Instrument	Orthopaedic	plaspint.ortho	Plastic Splints								NAH/CVHs/DVHs
255	Orthopaedic Instrument	Orthopaedic	trephlar.ortho	Trephine - Large								NAH/CVHs/DVHs
256	Orthopaedic Instrument	Orthopaedic	trephsmall.ortho	Trephine - Small								NAH/CVHs/DVHs
257	Packing & Dispensing Equipment	Dispensing Equip	polybag.dispen	Dispensing Polythene Bag								All
258	Packing & Dispensing Equipment	Packing Equip	clip.pack	Packing Clip								DVHs/LCS
259	Packing & Dispensing Equipment	Packing Equip	machine.pack	Packing Machine								DVHs/LCS
260	Packing & Dispensing Equipment	Packing Equip	strap.pack	Packing Strap								DVHs/LCS
261	Packing & Dispensing Equipmt	Packing Equip	strip.pack	Packing Strip								DVHs/LCS

262	Restraining Equipment	Restraints	jabstik.restreq	Automatic Jab Stick - Dan-Inject	Dan-Inject	NAH/CVHs/DVHs
263	Restraining Equipment	Restraints	bullnospunch.restreq	Bull Nose Punching Machine	SS, 340mm	CFs/CAs
264	Restraining Equipment	Restraints	bullnosring.restreq	Bull Nose Ring	SS, 55mm	CFs/CAs
265	Restraining Equipment	Restraints	ecolbird.restreq	Buster E-Collar for Birds	Kruuse	NAH/CVHs/DVHs
266	Restraining Equipment	Restraints	ecolcat.restreq	Buster E-Collar for Cat	Kruuse, 10pc/pkt	NAH/CVHs/DVHs
267	Restraining Equipment	Restraints	ecol12.5dog.restreq	Buster E-Collar for Dog - 12.5cm	12.5cm, Kruuse	NAH/CVHs/DVHs
268	Restraining Equipment	Restraints	ecol15dog.restreq	Buster E-Collar for Dog - 15cm	15cm, Kruuse	NAH/CVHs/DVHs
269	Restraining Equipment	Restraints	ecol7.5dog.restreq	Buster E-Collar for Dog - 7.5cm	7.5cm, Kruuse	NAH/CVHs/DVHs
270	Restraining Equipment	Restraints	rope.restreq	Casting Rope	15m, Cotton	All
271	Restraining Equipment	Restraints	catgrab.restreq	Cat Grabber	Kruuse, 76cmX12x12.5	NAH/CVHs/DVHs
272	Restraining Equipment	Restraints	doggrab.restreq	Dog Catcher/Grabber	Plastic covered steel cable, Kruuse	NAH/CVHs/DVHs
273	Restraining Equipment	Restraints	injcegecat.restreq	Injection Cage for Cats	45x30x30cm cage	NAH/CVHs/DVHs
274	Restraining Equipment	Restraints	mouthgaglar.restreq	Mouth Gag - For large animals	For large animals	All
275	Restraining Equipment	Restraints	mouthgagsma.restreq	Mouth Gag - For small animals	For small animals	All
276	Restraining Equipment	Restraints	mouthgagunth.restreq	Mouth Gag - SS with screw, Gunther	SS with screw, Gunther	All
277	Restraining Equipment	Restraints	mouthwedbay.restreq	Mouth Wedge - Bayer, 20mm, For Horse/Cattle	Bayer, 20mm, For Horse/Cattle	All
278	Restraining Equipment	Restraints	muzzle3.restreq	Muzzle - No. 3	No. 3	All

279	Equipment Restraining Equipment	Restraints	muzzle4.restreq	Muzzle - No. 4	No. 4	All
280	Restraining Equipment	Restraints	muzzle5.restreq	Muzzle - No. 5	No. 5	All
281	Restraining Equipment	Restraints	dogcage.restreq	Dog cages	9 cage combination, SS	NAH/CVHs/DVHs
282	Restraining Equipment	Restraints	dartgun.restreq	Darting gun	Foot pump pistols, PI and the CO2 PI operated	RLDCs, NCAH, DVHs, CVHs
283	Sterilizers & Autoclaves	Autoclave	tape.autclav	Autoclave Tape	Tarsons/Raven bio Lab, Roll	NAH, CVHs, DVHs, CFs, CAs
284	Sterilizers & Autoclaves	Autoclave	stmtape.autclav	Indicator Tape for Steam	Tarsons, 1 roll/pkt	NAH, CVHs, DVHs, CFs, CAs
285	Sterilizers & Autoclaves	Sterilizers	electbig.strlizr	Electric Sterilizer - Big	SS, Big	NAH, CVHs, DVHs, CFs, CAs
286	Sterilizers & Autoclaves	Sterilizers	electsmall.strlizr	Electric Sterilizer - Small	SS, Small	NAH, CVHs, DVHs, CFs, CAs
287	Sterilizers & Autoclaves	Sterilizers	needburn.strlizr	Needle Bumer and Syringe destroyer - SS, Electric	SS, Electric	NAH, CVHs, DVHs, CFs, CAs
288	Sterilizers & Autoclaves	Sterilizers	portsteam1.strlizr	Portable Steam Stericlave	SS, 5L capacity	NAH, CVHs, DVHs, CFs, CAs
289	Sutures & Suture Needles	Suture Needles	strgt11cc.sutndl	Suture Needle (Cutting edge) - Size 11, straight	Size 11, regular edge, straight	All
290	Sutures & Suture Needles	Suture Needles	hlfcc11cc.sutndl	Suture Needle (Cutting edge) - Size 11, semicircle	Size 11, regular eye, semicircle	All
291	Sutures & Suture Needles	Suture Needles	strgt3cc.sutndl	Suture Needle (Cutting edge) - Size 3, straight	Size 3, regular edge, straight	All
292	Sutures & Suture Needles	Suture Needles	hlfcc3cc.sutndl	Suture Needle (Cutting edge) - Size 3, semicircle	Size 3, regular eye, semicircle	All
293	Sutures & Suture Needles	Suture Needles	strgt5cc.sutndl	Suture Needle (Cutting edge) - Size 5, straight	Size 5, regular edge, straight	All
294	Sutures & Suture	Suture Needles	hlfcc5cc.sutndl	Suture Needle (Cutting	Size 5, regular eye,	All

295	Needles Sutures & Suture Needles	Suture Needles	strgt8cc.sutndl	edge) - Size 5, semicircle Suture Needle (Cutting edge) - Size 8, straight	semicircle Size 8, regular edge, straight	All
296	Sutures & Suture Needles	Suture Needles	hffc8cc.sutndl	Suture Needle (Cutting edge) - Size 8, semicircle	Size 8, regular eye, semicircle	All
297	Sutures & Suture Needles	Suture Needles	strgt11p.sutndl	Suture Needle (Taper point) - Size 11, straight	Size 11, regular edge, straight	All
298	Sutures & Suture Needles	Suture Needles	hffc11p.sutndl	Suture Needle (Taper point) - Size 11, semicircle	Size 11, regular eye, semicircle	All
299	Sutures & Suture Needles	Suture Needles	strgt3tp.sutndl	Suture Needle (Taper point) - Size 3, straight	Size 3, regular edge, straight	All
300	Sutures & Suture Needles	Suture Needles	strgt5tp.sutndl	Suture Needle (Taper point) - Size 5, straight	Size 5, regular edge, straight	All
301	Sutures & Suture Needles	Suture Needles	hffc5tp.sutndl	Suture Needle (Taper point) - Size 5, semicircle	Size 5, regular eye, semicircle	All
302	Sutures & Suture Needles	Suture Needles	strgt8tp.sutndl	Suture Needle (Taper point) - Size 8, straight	Size 8, regular edge, straight	All
303	Sutures & Suture Needles	Suture Needles	hffc8tp.sutndl	Suture Needle (Taper point) - Size 8, semicircle	Size 8, regular eye, semicircle	All
304	Sutures & Suture Needles	Suture Needles	vulv19.sutndl	Vulva Suturing needle - 19cm	19cm, SS	NAH/CVHs/DVHs
305	Sutures & Suture Needles	Suture Needles	vulv30.sutndl	Vulva Suturing needle - 30cm	30cm, SS	NAH/CVHs/DVHs
306	Sutures & Suture Needles	Sutures	chrcat2.sutr	Catgut Chromic - 2	2(6metric), 152cm, 12/pkt	All
307	Sutures & Suture Needles	Sutures	chrcat2-0.sutr	Catgut Chromic - 2-0	2-0, 152cm, 12/pkt	All
308	Sutures & Suture Needles	Sutures	chrcat3.5.sutr	Catgut Chromic USP 210 EP - 3.5	USP 210 EP - 3.5	All
309	Sutures & Suture Needles	Sutures	polycat1.sutr	Catgut Polyglactin 910 - 1	1(4metric), 90cm, 12/pkt	All
310	Sutures & Suture Needles	Sutures	polycat2-0.sutr	Catgut Polyglactin 910 - 2- 0	2-0, 90cm, 12/pkt	All

311	Sutures & Suture Needles	Sutures	pgacatl .sutr	Catgut Polyglcolic acid (PGA) - 1	1(4metric), 90cm, 12/pkt	All
312	Sutures & Suture Needles	Sutures	pgacat2-0.sutr	Catgut Polyglcolic acid (PGA) - 2-0	2-0, 90cm, 12/pkt	All
313	Sutures & Suture Needles	Sutures	polymidecat2.sutr	Catgut White Polyamide - 2	2(5metric), 100cm, 12/pkt	All
314	Sutures & Suture Needles	Sutures	polymidecat2-0.sutr	Catgut White Polyamide - 2-0	2-0(3metric), 100cm, 12/pkt	All
315	Sutures & Suture Needles	Sutures	polymidecat3.0.sutr	Catgut White Polyamide - 2EP-3.0	2EP-3.0 (Supermid)	All
316	Sutures & Suture Needles	Sutures	polymidecat3.5.sutr	Catgut White Polyamide - 2EP-3.5	2EP-3.5 (Supermid)	All
317	Sutures & Suture Needles	Sutures	polymidecat5.0.sutr	Catgut White Polyamide - 2EP-5.0	2EP-5.0 (Supermid)	All
318	Sutures & Suture Needles	Sutures	silkthrd22.sutr	Silk Thread (Medigold)	Black, 22m, 12pc/pkt, Medigold	All
319	Syringes & Needles	Needles	adap4nced.needle	Adapter for needle syringe	NA	NAH, CVHs, DVHs, CFs, CAs
320	Syringes & Needles	Needles	epi18.needle	Epidural Needle - 18G	18X3, SS	NAH, CVHs, DVHs, CFs, CAs
321	Syringes & Needles	Needles	hypo15g.needle	Hypodermic Needle - 15G	15GX1.5", 10pc/pkt	All
322	Syringes & Needles	Needles	hypo16g.needle	Hypodermic Needle - 16G	16GX1.5", 10pc/pkt	All
323	Syringes & Needles	Needles	hypo17g.needle	Hypodermic Needle - 17G	17GX1.5", 12pc/pkt	All
324	Syringes & Needles	Needles	hypo18g.needle	Hypodermic Needle - 18G	18GX1.5", 100pc/pkt	All
325	Syringes & Needles	Needles	hypo19g.needle	Hypodermic Needle - 19G	19GX1.5", 100pc/pkt	All
326	Syringes & Needles	Needles	hypo20g.needle	Hypodermic Needle - 20G	20GX1.5", 100pc/pkt	All
327	Syringes &	Needles	hypo21g.needle	Hypodermic Needle - 21G	21GX1.5", 100pc/pkt	All



328	Needles Syringes & Needles	Needles	ivcan20g.needle	IV Camula - 20G	20G, Greers type	NAH/CVHs/DVHs
329	Syringes & Needles	Needles	ivcan22g.needle	IV Camula - 22G	22G, Greers type	NAH/CVHs/DVHs
330	Syringes & Needles	Needles	ivinfus18g.needle	IV Infusion Needle - 18G	18G	All
331	Syringes & Needles	Needles	auto15g.needle	Needle for Automatic Syringe - 15G	15G	All
332	Syringes & Needles	Needles	auto16g.needle	Needle for Automatic Syringe - 16G	16G	All
333	Syringes & Needles	Needles	auto18g.needle	Needle for Automatic Syringe - 18G	18G	All
334	Syringes & Needles	Needles	auto20g.needle	Needle for automatic syringe - 20G	20G	All
335	Syringes & Needles	Needles	autoimp.needle	Needle for Automatic Syringe - Imported	Imported	All
336	Syringes & Needles	Needles	butterfly.needle	Butterfly needle	Luer slip, 20, 21, 22, 23, 24 & 25 gauges	NAH/CVHs/DVHs
337	Syringes & Needles	Syringes	auto10.syrng	Automatic syringe - 10ml, Imported	10ml, Imported	All
338	Syringes & Needles	Syringes	auto1.syrng	Automatic syringe - 1ml, Imported	1ml, Imported	All
339	Syringes & Needles	Syringes	auto30.syrng	Automatic syringe - 30ml, Imported	30ml, Imported	All
340	Syringes & Needles	Syringes	auto50.syrng	Automatic syringe - 50ml, Imported	50ml, Imported	All
341	Syringes & Needles	Syringes	barr4auto30.syrng	Automatic syringe Barrel - 30ml	30ml	All
342	Syringes & Needles	Syringes	barr4auto50.syrng	Automatic syringe Barrel - 50ml	50ml	All
343	Syringes & Needles	Syringes	dispo10.syrng	Disposable Syringe - 10ml	10ml, 100/pkt	All

344	Syringes & Needles	Syringes	dispo1.syrng	Disposable Syringe - 1ml	1ml	All
345	Syringes & Needles	Syringes	dispo20.syrng	Disposable Syringe - 20ml	20ml, 50/pkt	All
346	Syringes & Needles	Syringes	dispo2.syrng	Disposable Syringe - 2ml	2ml, 100/pkt	All
347	Syringes & Needles	Syringes	dispo50.syrng	Disposable Syringe - 50ml	50ml, 25/pkt	All
348	Syringes & Needles	Syringes	dispo5.syrng	Disposable Syringe - 5ml	5ml, 100/pkt	All
349	Syringes & Needles	Syringes	drench20.syrng	Drenching Syringe - 20ml	20ml	All
350	Syringes & Needles	Syringes	glas10.syrng	Glass Syringe - 10ml	10ml	All
351	Syringes & Needles	Syringes	glas20.syrng	Glass Syringe - 20ml	20ml	All
352	Syringes & Needles	Syringes	glas50.syrng	Glass Syringe - 50ml	50ml	All
353	Syringes & Needles	Syringes	glas5.syrng	Glass Syringe - 5ml	5ml	All
354	Syringes & Needles	Syringes	glyce100.syrng	Glycerine Syringe - 100ml	100ml	All
355	Syringes & Needles	Syringes	hvydy20.syrng	Heavy Duty Syringe - 20ml	20ml	All
356	Syringes & Needles	Syringes	hvydy10.syrng	Heavy Duty Syringe 10ml	10ml	All
357	Syringes & Needles	Syringes	hvydy5.syrng	Heavy Duty Syringe 5ml	5ml	All
358	Syringes & Needles	Syringes	nylon10.syrng	Nylon syringe - 10ml, Imported	10ml, Imported	All
359	Syringes & Needles	Syringes	nylon20.syrng	Nylon syringe - 20ml, Imported	20ml, Imported	All
360	Syringes & Needles	Syringes	nylon5.syrng	Nylon syringe - 5ml, Imported	5ml, Imported	All

	Needles			Imported		
361	Syringes & Needles	Syringes	spareauto30.syrng	Spare parts for Auto syringe - 30ml	30ml, Washers & other parts	All
362	Syringes & Needles	Syringes	spareauto50.syrng	Spare parts for Auto syringe - 50ml	50ml, Washers & other parts	All
363	Tables and Tools	Tables	examfold.table	Examination Table	2'X4'X2', Hydraulic, foot/electric operated	NAH/CVHs/DVHs
364	Tables and Tools	Tables	instrfold.table	Instrument Table - Folding type with trolley	Folding type with trolley	NAH/CVHs/DVHs
365	Tables and Tools	Tables	instrmofld.table	Instrument Table - Non-folding type	SS, Non-folding type	NAH/CVHs/DVHs
366	Tables and Tools	Tools	pmset.tool	Post-Mortem Set	SS, Large Animal	NCAH, RLDCs, CVHs, DVHs
367	Tables and Tools	Tools	almirah.tool	Steel Almirah	72X36X19", SS, 4 shelves	All
368	Tables and Tools	Tools	steelrack.tool	Steel Storage Rack	72X53X24", SS, 4 shelves	All
369	Tables and Tools	Tools	bowlstnd.tool	Bowl Stand	SS, Piece	All
370	Teat Instruments & Accessories	Teat Accessories	bovivetbndg.teat	Teat Bandage (Bovivet)	6cmX5m, Kruuse, Bovivet	All
371	Teat Instruments & Accessories	Teat Instrument	siphon.teat	Milk Siphon with concealed blade	Imported, concealed blade	All
372	Teat Instruments & Accessories	Teat Instrument	siphon3mm.teat	Milk Siphon - 3mm	SS, 3mm	All
373	Teat Instruments & Accessories	Teat Instrument	canula.teat	Teat Canula	SS, Piece	All
374	Teat Instruments & Accessories	Teat Instrument	compr.teat	Teat Compressor	SS, screw, 17cm, Fogelin pattern	All
375	Teat Instruments & Accessories	Teat Instrument	dila17ind.teat	Teat Dilator (Indian)	17cm, SS, Indian	All
376	Teat Instruments & Accessories	Teat Instrument	dila17kruuse.teat	Teat Dilator (Kruuse)	17cm, SS, Kruuse	All
377	Teat Instruments & Accessories	Teat Instrument	plugbulb.teat	Teat Plug - Bulbous	Bulbous	All

	Accessories											
378	Teat Instruments & Accessories	Teat Instrument	plugrings.teat		Teat Plug - Self retaining		With rings, self-retaining		All			
379	Teat Instruments & Accessories	Teat Instrument	slit18imp.teat		Teat Slitter (Imported)		18cm, Imported, SS	NAH/CVHs/DVHs				
380	Teat Instruments & Accessories	Teat Instrument	slit18ind.teat		Teat Slitter (Indian)		18cm, Indian, SS	NAH/CVHs/DVHs				
381	Teat Instruments & Accessories	Teat Instrument	extrairmp.teat		Teat Tumor Extractor (Imported)		SS, Imported	NAH/CVHs/DVHs				
382	Teat Instruments & Accessories	Teat Instrument	extrairnd.teat		Teat Tumor Extractor (Indian)		SS, Indian	NAH/CVHs/DVHs				
383	Tubes & Catheters	Catheters	uricathlar.cath		Urinary Cathetar for large animals		53.5cm, For large animals	NAH/CVHs/DVHs				
384	Tubes & Catheters	Catheters	uricathsma.cath		Urinary Cathetar for small animals		For small animals	NAH/CVHs/DVHs				
385	Tubes & Catheters	Tubes	endotracer.tube		Endo-tracheal Tube - Ger-dispo		Ger-dispo	NAH/CVHs/DVHs				
386	Tubes & Catheters	Tubes	endotracc345.tube		Endo-tracheal Tube - Size 3,4,5		Size 3,4,5 (dispo)	NAH/CVHs/DVHs				
387	Tubes & Catheters	Tubes	endotracc678.tube		Endo-tracheal Tube - Size 6,7,8		Size 6,7,8 (dispo)	NAH/CVHs/DVHs				
388	Tubes & Catheters	Tubes	probang.tube		Probang for cattle		12X1200mm, SS/wood/plastic	NAH/CVHs/DVHs				
389	Tubes & Catheters	Tubes	stomdog.tube		Stomach Tube for Dogs		8X80mm, No. 25	NAH/CVHs/DVHs				
390	Tubes & Catheters	Tubes	stomhor.tube		Stomach Tube for Horses		Silicomiced, 16X2700mm	NAH/CVHs/DVHs				
391	Weighing Equipment	Weighing equip	springbal.weight		Spring Balance		0 to 50kgs, Hand operated	All				
392	Weighing Equipment	Weighing equip	medbal.weight		Balance for medicines (Digital)		0-1000gm, Digital, Auto-calibration	All				
393	Weighing Equipment	Weighing equip	digbal.weight		Digital Scale		0-2200gm/0.1g reading, digital	All				
394	Weighing	Weighing equip	tape.weight		Weight measuring Tape for		Imported, For cattle	All				

	Equipment				Cattle & Pigs (Combi)	and pigs	
395	Weighing Equipment	Weighing equip	wscle. weight		Weighing scale for small animals	90X55cm, 0-250kg, SS, Walk on platform, digital	NAH/CVHs/DVHs
396	Wool Equipment	Wool Equip	shpshr. wool		Sheep Shearer (Wool shear)	With blade handle no. 50, 4teeth top & 13 teeth bottom	CFs/CAs

*Note:*

*All = NAH/CVHs/DVHs/CFs/CAs/LECs/RNRECs/Non-departmental Agencies/NGOs*

*NAH = National Animal Hospital*

*RLDCs = Regional Livestock Development Centers*

*NCAH = National Centre for Animal Health*

*CVHs = City Veterinary Hospitals*

*DVHs = District Veterinary Hospitals*

*LECs = Livestock Extension Centers*

*RNRECs = Renewable Natural Resources – Extension Centers*

*CFs = Central Farms*

*CAs = Central Agencies under Department of Livestock*