

**Clinical Handbook**  
**of Infections Diseases**  
**in Farm Animals**

**Dr. Hamed Attia**

**Summary of Important Infectious Diseases**  
**for Field Veterinarians**

**Handbook of Infectious Diseases in Farm Animals**

**Dr. Hamed Attia**

**First Edition, January 1, 2009.**

**Corresponding address: Department of Animal  
Medicine, Zagazig University.**

All rights reserved. This book is protected by copyright. No part of this book may be reproduced in any form or by any means, including photocopying or utilized by any information storage without written permission from copyright owner.

Cover design and plates color separation by Khader Graphic House in Zagazig.

رقم الإيداع بدار الكتب المصرية

## مقدمة الطبعة الأولى

أهدى هذا الكتاب إلى زملائي وأبنائي الأطباء البيطريين العاملين فى الحقل البيطرى وأشكرهم جميعا لأنهم منحونى من أوقاتهم الثمينة لقراءة ما قدمت من كتب سابقة فى مجال تشخيص وعلاج أمراض الحيوان وبناء على طلب الكثيرين من ضرورة إصدار نسخة جديدة من كتاب مختصر لعلاج الأمراض المعدية مثل كتاب أمراض الباطنة حتى تكتمل السلسلة لدى الطبيب ولذلك قمت بإعداد هذا الكتاب وأسأل الله أن ينال إعجابكم وأن أنال الأجر من الله سبحانه وتعالى فهو الموفق والهادى إلى الصراط المستقيم. وأنا على استعداد لتقبل اقتراحاتكم واستفساراتكم عن أى موضوع بخصوص مجموعة الكتب التى صدرت أو إصدار كتب جديدة تحتاجونها.

مع تمنياتى للجميع بالتوفيق.

د. حامد عطية محمد

أستاذ أمراض الباطنة

كلية الطب البيطرى – جامعة الزقازيق

محمول: 00966547209365

# **Dedication**

To

My family for their constant and loving support  
to advance this book to new levels.

# Index

	<u>Page</u>
<b>I. Calf diseases</b> .....	
1- Infectious calf diarrhea.....	1
2- Respiratory disease complex.....	5
3- Navell ill.....	8
4- Verminous pneumonia.....	9
5- Calf diphtheria.....	10
6- Calf enterotoxemia.....	11
7- Bulby kidney.....	12
8- Coccidiosis.....	13
9- Ascariasis.....	14
10- Ring worm.....	15
11- Lamb Dysentery.....	16
<b>II. Bacterial diseases in cattle and sheep</b> .....	
1- Mastitis.....	17
2- Anthrax.....	19
3- Malignent edema.....	20
4- Braxy.....	20
5- Blackleg.....	21
6- Big Head.....	22
7- Black disease.....	23
8- Bacillary hemoglobinuria.....	24
9- Tetanus.....	25
10- Brucellosis.....	26
11- Listeriosis.....	27
12- Leptospirosis.....	28

13- Contagious bovine pleuropneumonia.....	29
14- Haemorrhagic septicaemia.....	30
15- Tuberculosis.....	31
16- Johne's disease.....	32
17- Actinomycosis.....	33
18- Actinobacillosis.....	34
19- Caseous lymphadenitis.....	35
20- Edematous skin disease.....	36
21- Bovine farcy.....	37
22- Infectious bovine keratoconjunctivitis.....	38
23- Contagious foot rot.....	39
24- Salmonellosis.....	40
<b>III. Viral diseases in cattle and sheep.....</b>	
1- Foot and mouth disease.....	41
2- Vesicular stomatitis.....	42
3- Bovine ephemeral fever.....	43
4- Contagious ecthyma.....	44
5- Lumpy skin disease.....	45
6- Blue tongue.....	46
7- Rift valley fever.....	47
8- Bovine viral diarrhoea.....	48
9- Cow and buffalo pox.....	49
10- Pseudo cow pox.....	50
11- Sheep and goat pox.....	51
12- Malignant catarrhal fever.....	52
13- Infectious vulvo-vaginitis in cattle.....	53
14- Infectious pustular balanoposthitis in bulls.....	53

15- Enzoatic bovine leukosis.....	54
16- Infectious bovine rhinotracheitis (IBR).....	55
<b>IV. Blood parasites.....</b>	
1- Bovine babesiosis.....	56
2- Tropical theileriosis.....	57
3- Anaplasmosis.....	58
4- Toxoplasmosis.....	59
<b>V. Parasitic diseases.....</b>	
1- Mange.....	60
2- Warble.....	61
3- Screw worm myiasis.....	62
4- Nasal myiasis.....	63
5- Fascioliasis.....	64
6- Paramphistomiasis.....	65
7- Filariasis.....	66
8- Tapworm infestation.....	67
9- Coenurosis.....	68
<b>VI. Fungal disease.....</b>	
1- Dermatophilosis.....	69
<b>VII. Differential diagnosis.....</b>	
I. Differential diagnosis of cattle diseases.....	70
II. Differential diagnosis of sheep and goat diseases.....	81
III. Differential Diagnosis of Equine Diseases.....	88
IV. Differential diagnosis of dog diseases.....	91
Infectious diseases problems and signs of ill-health in camels.....	99

<b>VIII. Vaccination program</b> suggested for cattle and buffaloes in Egypt.....	106
Vaccination program suggested for sheep and goats in Egypt.....	107
Equine vaccines.....	108
Camel vaccines.....	110
Pet-animals vaccines.....	110
Trade name of some vaccine used for protection of pneumonia and enteritis.....	112
<b>IX. Laboratory diagnosis</b> .....	
1- Sample collection.....	113
2- Faecal examination.....	116
3- Blood examination.....	124
4. Skin examination.....	128
5. Diagnosis of mastitis.....	132
<b>X. Drug index</b> .....	
A- Anthelmintics.....	140
B- Antibiotics.....	142
C- Anti-inflammatory, analgesic and antipyretic.....	144
D- Drugs used for treatment of blood parasites.....	145



## **Infectious calf diarrhea (ICD)**

### **Acute undifferentiated diarrhea**

**Definition:** Calf diarrhea complex is a serious problem and cause economic loss due to mortality. It is predominates during the first 30-50 days of life. The main cases are E. coli, salmonellosis, clostridial enterotoxemia, rotavirus, corona virus, infectious bovine rhinotracheitis and cryptosporidiosis.

#### **Pathophysiology:**

In young calves, death caused by diarrhea due to fluid losses and electrolytes imbalance and less to energy deficits resulting from reduced intake, malabsorption and increased excretion of wastes, minerals and nutrients.

Metabolic acidosis arises from an increased loss of bicarbonate in the feces, an increased production of lactic acid and reduction in renal excretion of hydrogen ion ( $H^+$ ) due to decreased blood volume associated with dehydration.

Hyponatremia due to loss of Na in the feces. Hyperkalemia and hypoglycemia are common in dehydrated calves.

#### **Clinical findings:**

It depends upon the causative microorganism but all infections causes severe watery diarrhea, fever, dehydration, recumbency and signs of toxemia, subnormal temperature and lateral recumbency and death.

#### **Treatment:**

##### **Line of treatment:**

1- Antacid.

R/ Isotonic sodium bicarbonate (1.3%), 0.5 liter I/V.

للحقن في الوريد جرعة واحدة لمعادلة حموضة الدم.

2- Fluid therapy

R/ NaCl (0.9%), 1-2 liter I/V.

3- Non steroidal anti-inflammatory

R/ Dicloflam 2.5%, 2 ml/50 kg I/M.

4- Antibiotic:

\*Systemic antibiotic

R/ Cidostine vial: 1 vial/40 kg I/M.

Or Cefotaxim vial, 1.5 ml/15 kg I/V.

Or flurophenicol inj., 1 ml/15 kg I/M, every 48 hours.

\*Local antibiotic (orally):

R/ Chloramphenicol powder 5 g orally.

5- Intestinal antiseptic and astringent.

R/ Sulphaguanidine 10 g orally.

R/ Tannic acid 5 g orally.

R/ starch 100 g.

Mix the above powders together in 0.5 liter water and given orally daily for 3-5 days.

**Patent preparations:**

R/ Diaclean 0.5 Sachet twice daily orally.

**Or** Neodirestin 1-2 Sachet/daily orally.

**Or** Cosmix plus scourpan, coliprim, sulphatrimethprim.

**Control:**

Vaccination of dams by scour guard or Rotavec vaccine.

- You can give new born calves (one day old) a Coli immune, hyper-immune serum orally for protection against E. coli.

### **Important notes regarding calf diarrhea**

- 1-Death of calves is generally the outcome when fluid therapy has been initiated too late or fluid therapy has not been aggressive enough. (Too little, too late).
- 2-Only E. coli, Clostridium and Salmonella benefit from antibiotic treatment.
- 3-Oral antibiotic in infectious diarrhea is of no value.
- 4-All scouring calves need fluid therapy and acid-base correction. Most calves dying from dehydration and/or acidosis.
- 5-Calves with diarrhea needs milk for energy.
- 6-Calves on fluids-only for over 48 hours have lower survivability than calves that continue to get milk during oral fluid therapy.
- 7-If calf suckles milk, give oral fluid therapy 20-30 minutes later.
- 8-If tube feed milk, wait at least 2 hours to give oral fluid therapy. Reason is to get clotting of milk in abomasum.

#### **Principles for prevention of neonatal disease:**

- 1-Calves kept in confinement should be housed in individual calf pens for at least the first month of life.
- 2- Portable calf hutches have proven to be very successful, as they afford isolation and can be moved to clean ground when necessary.
- 3-Clean pens thoroughly between calves dry.
- 4- Keep the calf pens clean.

5- Provide overhead shelter for the calf pens.

6-Calves with diarrheal disease should be isolated from healthy calves and fed last.

7-Clean feeding equipment after each use.

8-Do not overfeed, milk intake should be restricted to 10% of the body weight daily for the first 7-10 days.

9- Calves should be fed on a regular schedule with fresh whole milk or good quality milk replacer.

10- Providing Resistance for the Calf:

A-The resistance of the calf to disease depends predominately on the quality and amount of colostrums received from the cow during the first hours of life after birth, as there is no transfer of resistance from cow to calf before birth.

B-Calves should receive colostrum within the first 6-8 hours after birth.

C-Colostrum contains antibodies which provides. This resistance, are manufactured by the cow's immune system.

D-The calf's digestive system will absorb these antibodies in progressively decreasing amounts for only the first 24 hours.

E-In order to provide maximum resistance to disease for the calf, a vaccination program must be developed for the cow herd in order to ensure that antibody specific to the disease problem is present in colostrums of calving cow.

## **Respiratory Disease complex in calves**

**Definition:** It is a multi-factorial disease (viral-bacterial-mycoplasma and clamydia) with several predisposing causes (environment and management).

### **Etiology of respiratory disease complex in calves**

#### **1. Viral**

- Respiratory syncytial virus (BRSV)
- Para Influenza Virus II, III
- Bovine viral diarrhea virus (BVDV)
- Infectious rhinotracheitis (IBR)

#### **2. Bacteria and mycoplasma**

- |                            |                          |
|----------------------------|--------------------------|
| - Pasteurella haemolytica. | - Pasteurella multocida. |
| - Mycoplasma dispar.       | - Mycoplasma mycoides.   |
| - Subsp. Mycoides.         | - Mycoplasma bovis.      |

### **Clinical signs**

#### **Acute form:**

Decreased appetite and wide spread coughing. The affected animals appear dull and the heads to be carried lower than normal, pyrexia (40-41°C). Other signs including a mucoid or mucopurulent oculo-nasal discharge, tachypnoea, dyspnoea and hyperpnoea are normally present.

On auscultation of the thorax there are usually loud, harsh sounds or whistling, wheezing or squeaking. These sounds may be present at inspiration or expiration, but more commonly they are heard at the latter and in some cases there are fluid sounds such as bubbling or gurgling, which will be audible in the cranio-ventral parts of the lungs. In some bacterial infections, where there is marked consolidation, few sounds are present.

### **Chronic form**

The condition is one of gradual onset. There is generally no illness and so the calf is bright, eats well, but it may have a slight mucoid or mucopurulent oculo-nasal discharge. The temperature is normal or slightly elevated (38.5-39.5°C). Respiratory rate may vary from normal to 100 /minute, with a normal pulse. There is a dry explosive cough that is usually produced singly. On auscultation there are noises of whistling, wheezing or squeaking and these are more commonly heard at expiration, although often they occur at both inspiration and expiration. The sounds are most common in the anterior and ventral parts of the chest.

### **Treatment**

#### **1- Antimicrobials for treatment and prevention of bovine pneumonia**

<b>Name of the drug</b>	<b>Dose</b>	<b>Rout of administration</b>
1- Florfenicol	20 mg/kg B.W.	I.M repeat in 48 h
2- Trimethoprim-sulfadoxine	20 mg/kg B.W.	I/V, I/M repeat in 48 h
3- Sulfademedine 33.3%	Initial 200 mg/kg Maintenance 100 mg/kg	I/V
4- Tilmicosin	10 mg/kg B.W.	S/C and repeat 72 h. if necessary
5- Enrofloxacin	2.5 mg/kg B.W.	I/M daily for 3-5 day or single dose 10 mg/kg B.W.
6- Cefatoxime Na	6 mg/kg B.W	I/V for 3 day.

#### **2- Steroidal anti-inflammatory**

R/ Dexamethasone 5Ml I/V.

#### **3- Non steroidal anti-inflammatny drugs:**

R/ dicloflame 2.5% 4ml / 100 kg I/M.

#### **4- Supportive therapy (Mineral & Vitamins)**

R/ Antoplex. 5 ml I/M

R/ Divedry- Ject (AD3E+C) 5 ml I/M.

#### **5- Anti-histaminic drugs**

R/Avil amp. 1 amp./40 Kg B.W.

#### **Causes of failure of pneumonic calves to respond to treatment:**

- 1- Advanced pneumonia before treatment is initiated.
- 2- Presence of viral or interstitial pneumonia.
- 3- Inadequate dose of antimicrobials.
- 4- Antimicrobial resistance of the bacteria.
- 5- Complications, such as pulmonary abscess and pleuritis.

#### **Prevention and control:**

- 1- Avoid stress factors such as weaning, castration and shipping etc.
- 2- Different age groups are not mixed together.
- 3- Dead vaccines are used to provide immunity against *P. multocida*.
- 4- Cattle Master 4 vaccine is indicated for vaccination of healthy cattle including pregnant cows to prevent diseases caused by IBR, BVD, PI3 and BRSV viruses.

### **Navel Ill (Navel ill - Joint ill)**

**Definition:** It is a common problem in the calf at birth caused by invasion of umbilical cord with a wide variety of organisms as streptococcus spp., E. coli., Erysipelothrix insidiosa, Pasteurella multocida, Actinomyces pyogenes and Fusobacterium necrophorum.

#### **Clinical signs**

The navel is swollen and usually painful. The umbilical blood vessels are swollen. Localized peritonitis, septicemia, depression, pyrexia (40.5°C) and accelerate respiratory and pulse rates. The mucous membranes become reddened with petechial hemorrhages. There may be a varying degree of dehydration, followed later by acidosis, recumbency and death. In animals with localization in the heart valves, endocarditis result with a heart murmur. If the eye is involved there is panophthalmitis with hypopyon. In case of meningitis there is nystagmus, hyperesthesia and tonic-clonic convulsions. The most common form is joint ill and one or more joints may be involved. In many cases there is bilateral involvement with pain and swelling, commonly of the carpal joints.

#### **Treatment:**

##### **1. Broad spectrum antibiotic (systemic).**

R/ Trioxyl L.A. 1 ml/10 kg. B.W/48 hours.

Or R/ Pen-strep 1 ml/25 kg B.wt I/M for 10 days.

##### **2. Local injection**

In chronic joint ill injection of lincomycin given good results.

##### **3. Surgical interference:**

Surgical opening of the joints with removal of pus and affected tissue and joint flushing with antiseptics in chronic supportive arthritis.



## Verminous Pneumonia

**Definition:** It is an acute, sub-acute or chronic infectious respiratory disease of ruminant and equines, caused by nematode parasites and characterized clinically by respiratory distress, and pathologically by bronchitis and broncho-pneumonia.

### Clinical signs

**In acute cases:** there is sudden onset of rapid shallow breathing. Frequent cough, a slight nasal discharge and fever, increased heart rate. By auscultation, all parts of the lungs are involved and showed abnormalities such as, increase vesicular murmur and bronchial tones, dyspnea may be associate with mouth breathing and severely affected animals stand in a characteristic head extended position.

**In subacute cases:** diarrhea, normal temperature or slightly elevated, increase in respiration, frequent paroxysms of coughing, long course 3-4 weeks, the auscultation findings vary widely with duration of the illness and the area of the lung involved. In general there is consolidation and bronchitis ventrally and marked emphysema dorsally.

### Treatment

1-Anthelemetic drugs:

R/ Univomec 1% 1 ml / 50 kg S/C.

Or Dectomax 1 ml / 50 kg S/C. للحقن مرة واحدة تحت الجلد

2-Broad spectrum antibiotic

R/Oxy 5% 1 ml /10 kg B.W. to prevent secondary infection.

للحقن في العضل لمدة 3 – 5 أيام لتجنب العدوى الثانوية

3- Vitamin AD3&C:

R/ Divedry-Ject 5 ml I/M in calves. يوميا لمدة 5 أيام

## Calf Diphtheria

**Definition:** There are two forms, oral which is most common and laryngeal caused by *Fusobacterium necrophorum*.

**Clinical signs:**

Dullness with in-appetance or anorexia. Often there is pyrexia (40.5°C). There is a cough that is moist and painful. The mouth may be foul smelling. Many of these animals do not respond well to treatment and the diphtheritic area may become detached resulting in sudden asphyxiation or lung infection.

**Treatment**

**1- Antibiotics:**

**A-Systemic:**

R/ Pent-strep 1 ml/25 kg B.W. I/M for 5-7 days

تكرر الجرعة كل 24 ساعة 3-5 مرات

**B-Local antibiotic:**

Mixture of teramycine, alum and sesem buter in the mouth

**2- Non stesiodal anti-inflammatry drugs:**

R/ Finadyne 1 ml/45 kg B.W. I/V.

**3- Supportive therapy:**

R/ Multi-vitamins (AD3E+C) 5 ml I/M.

## Calve Enterotoxemia

**Definition:** It is caused by *Cl. perfringens* types B and C which occurs in young calves up to 10 days occasionally up to 10 weeks .It is characterized by sudden death without pervious illness or by-severe dysentery, diarrhea without fever, acute abdominal pain, nervous manifestation, including tetany and opisthotonus and death.

### Treatment

- In acute cases, no treatment
- In mild cases, pencilline (large dose) can prevent further proliferation of the organism and production of toxins.

### N.B.

- In endemic areas, control must depend on vaccination of polyvalent vaccines.

## **Bulby Kidney**

**Definition:** It is an acute infectious toxemic disease of ruminants especially sheep, caused by the toxin of *Cl. perfringens* type D and characterized clinically by diarrhea, convulsion, paralysis and sudden death.

### **Clinical signs**

#### **In sheep**

In lambs morbidity rate 10%, mortality rate is 100%. The course of the disease is too short usually less than 2 hours and never more than 12 hours and the disease is characterized by sudden death or the lamb showed signs of illness as dullness, depression, anorexia, convulsion, salivation, diarrhea, staggering, recumbancy, opisthotonus and death.

In adult sheep the course may extend to 24 hours, the animal isolates themselves, staggering, knuckling, champing of the jaws, salivation, shallow rapid respiration, irritation signs including convulsions, muscle tremor, grinding of the teeth, salivation and death.

#### **In calves**

The course may be longer up to 36 hours, the disease is characterized by sudden deaths or animals showed signs of dullness, bellowing, mania, convulsions, anorexia, diarrhea, fever, abdominal pain, dysentery and death.

### **Treatment:**

Of little value.

### **Prevention and control:**

In Egypt, lamb dysentery and bulby kidney vaccine is produced as a bivalent alum precipitated toxoids prepared from toxic strain of *Cl. perfringens* type B and D.

## Coccidiosis

**Definition:** It is an acute or chronic contagious disease of calves, lambs, kids and foals, caused by Eimeria spp., and characterized clinically by hemorrhagic enteritis, diarrhea, dysentery, depression, weakness, loss of weight and the chronic form characterized by low in growth rate and production.

**Clinical signs:**

Sudden onset of severe diarrhea, with foul smelling, fluid feces containing mucous and blood. Severe straining is characteristic, rectal prolapse may occur in severe cases. Pale mucous membrane, weakness, dehydration, staggering, dyspnea and anorexia. Nervous signs consisting of muscular tremors hyperthesia, clonic tonic convulsions with ventro-flexion of the head, neck and nystagmus may be present in severe cases

**Treatment:**

**1-Anti-coccidial drugs:**

R/ Amprolium 65 mg/kg orally لمدة 3-5 أيام عن طريق الفم

R/ Sulfadimidine 140 mg/kg orally لمدة 5 أيام عن طريق الفم

**Or** R/ Sulfatrim tablet 1 tablet/ 40kg

½ الجرعة صباحا و ½ الجرعة مساء لمدة 5 أيام عن طريق الفم

**2- Vitamins:**

R/ Divedry- Ject 5ml I/M يوميا لمدة 5 أيام

R/ Vit K. 1 amp/70Kg BW.I/M daily (For bleeding).

**3-Electrolytes:**

R/ 0.9% NaCl 2 liters I/V

**4- Intestinal coating and astringent.**

R/ Starch powder 100 g orally.

R/ Tannic acid powder 5 g orally

يخلط النشا مع حمض التانيك ويذاب في نصف لتر ماء ويعطى عن طريق الفم لمدة 3 أيام.

## Ascariasis

**Definition:** It is an acute or chronic infectious disease of calves and foals caused by ascarid worms and characterized clinically by digestive disturbances and poor growth in young animals.

### Clinical signs

It is usually seen in young animals, larvae migrating through lungs cause pneumonic. Signs such as dyspnea, coughing, as well as poor coat, diarrhea, occasionally colic. In addition to convulsions, intestinal obstruction and perforation.

### Treatment

1-Anthelemetic drugs:

R/ Univomec (Ivermectin) 1 ml/50 kg S/C

للحقن مرة واحدة تحت الجلد

Or

R/ Piperazine citrate 25 g/calve orally.

Or R/ Banminth 1 g/10 kg orally.

عن طريق الفم جرعة واحدة

Purgative:

R/Magnesium sulphate 50 gm/orally.

تعطى عن طريق الفم بعد التجريع بساعتين

## Ring Worm (Trichophytosis)

**Definition:** It is an infectious disease of the outer skin layers caused by invasion of the keratinized epithelial cells and hair fibers by fungi (Trichophyton verrucosum, Tr. mentagrophytes & or Tr. Megnini).

**Clinical Findings:**

The disease is characterized by round areas of crusting and alopecia, 1-5 cm in diameter. It is common in calves periorcular region, ears, muzzle, neck and trunk. In adults, the lesion may be anywhere on the body but often appear on the trunk and neck.

**Treatment:**

R/ T. iodine 2% دهان في الأماكن المصابة يومياً بعد إزالة القشور

Or R/ Thiabendazol ointment 2% دهان مرتين يومياً

Or R/ Griseofulvin 10g/100kg BW.

يعطى عن طريق الفم يومياً على العليقة لمدة 7 أيام

**N.B.:** Most cases of ringworm are self limiting and the main goal of treatment to reduce spread to other animals and humans.

- The crust should be removed by scraping or brushing and burned.
- Local application with acids such as vingers, propionic acid, thiabendazole 1-5%, iodine ointment 2-5% give good results.

## Lamb Dysentery

**Definition:** It is an acute infectious toxemic disease of new born lambs and calves, caused by the toxin of *Cl. perfringens* type B and characterized clinically by short course, diarrhea and ulcers in the small intestine.

### Clinical Signs

Morbidity rate up to 30%, mortality rate up to 100%, the course of the disease is too short within few hours, occasionally extended to few days in calves and lambs.

### In Lambs

It is a toxemic disease and may be in one of the following forms:

**Peracute form:** It is manifested by sudden death without previous illness.

**In acute form:** the affected lambs isolate themselves, showed severe abdominal pain during palpation, recumbancy, inability to suck, the fluid feces yellow to brown and contain blood, coma, death within 24 hours of the onset of illness.

**Subacute form:** The affected lamb isolate themselves, arch their back, showed signs of abdominal pain, yellow diarrhea or dysentery, dehydration of skin and eyes, coma and death.

### Treatment

- In acute cases, no treatment
- In mild cases, penicillin (large dose) can prevent further proliferation of the organism and production of toxins.

### N.B.

In endemic areas, control must depend on vaccination of polyvalent vaccines such as covaxin 8 or covaxin 10.



## Mastitis

**Definition:** It is inflammation of the parenchyma of the mammary gland caused by Staphylococcus aureus, Streptococcal infections, Cory. pyogenes (Summer mastitis), E. coli infection (Environmental mastitis), and pseudomonas aeruginosa infections.

**Clinical signs:** Mastitis may be classified into:

### 1. Peracute mastitis:

It is characterized by sudden onset of severe inflammation of one or more quarters in association with severe systemic reaction includes toxemia, fever, tachycardia, ruminal stasis, anorexia, general depression and recumbency. There is a severe reaction in the udder, milk secretion has been ceased, exudates vary are often blood stained and the udder may be externally painful and swollen.

### 2. Acute mastitis:

Sudden onset of inflammation of one or more quarters together with changes in the nature of the milk, which may be accompanied by signs of mild systemic illness, is caused by Str. agalactiae, Staph. aureus or the organisms mentioned causing peracute mastitis may produce acute cases.

### 3- Subacute mastitis:

It is present when is continued inflammation of one or more quarters with persistent changes in milk quality.

### 4- Chronic mastitis:

This is very common type, the milk is changed and there is a recurrent attacks inflammation, with a variable amount of udder tissue reaction including fibrosis and atrophy. It may result from the same bacterial causes the acute type or Mycobacteria spp.

## Treatment:

### 1- Fluid Therapy (Specially in Coliform mastitis)

R/ Saline 0.9% 2-4 Liters للحقن في الوريد للتخلص من السموم

### 2-Broad spectrum antibiotics:

#### A-Systemic:

R / Pentomycine 4 Ml/100Kg BW I/M for 5-7 days

تكرر الجرعة كل 48 ساعة 3-5 مرات

#### B-Local antibiotic:

Tetr-Delta one syringe /each infected quarter

### 3- Non stesiodal anti-inflammatry drugs:

R/ Dicloprima 5% 2ml / 100 kg I/M.

### 4-Oxytocine:

R/ Oxytocine injection 3-4 ml I/V

### 5- Supportive therapy:

R/ Divedry- Ject (AD3E+C) 15ml/I/M.

Other antibiotics can be used such as:

Systemic	Local
1- Synlox (Amoxycillin + Clavunic acid).	Synlox
2- Flurfincol (Nuflor).	Tetra delta
3- Gentamycin + enrofloxacin.	Mastilex (Genta + Cephalosp)
4- Marbocil (E. coli).	No.
5- Cefotaxim	Mastilex

## **Anthrax**

**Definition:** It is a peracute, acute, sub acute, fatal, infectious, soil born, disease of mammals including humans, caused by bacillus anthracis and characterized by sudden death.

**Clinical signs:**

The peracute form of the disease is more common at the beginning of an outbreak and is characterized by sudden death without previous illness or in rare cases the animal showed signs of fever, muscle tremors, dyspnea, collapse and terminal convulsions with death occurring in 1-4 hours. After death discharges of blood from the nostrils, mouth, anus and vulva are common. The acute form of the disease is characterized by high fever, complete cessation of rumination, feeding, lactation and bloating may develop, depression, rapid and laboured respiration, diarrhea or dysentery and sometimes feces, urine and milk may be stained with blood, haemorrhagic congestion of the visible mucous membranes, pregnant animals may abort, local edema of the tongue and edematous swelling in the region of the throat, sternum, perineum and flanks may occur.

**Treatment**

No treatment.

N.B.:

(1) Anthrax is a notifiable disease, so, the owner or field veterinarians must immediately report any suspicious of the disease to the local authority for protection of both human and animal health.

(2) Infected carcasses should not be opened and immediately burned or buried together with discharges, bedding and soil, burial should be at least 2 meters with addition of quicklime.

## **Malignant Edema (ME)**

**Definition:** It is an acute infectious toxemic disease of cattle, sheep and horse, caused by the toxin of *Cl. septicum*, and characterized by fever, depression, edematous swelling around wounds and a fatal course.

### **Clinical signs**

IP varies from 1-4 days, morbidity rate is usually low, high mortality rate, short course within 12-48 hours.

ME in cattle and sheep characterized by marked depression, weakness, anorexia, high fever, sometimes normal body temperature, rapid respiration and sometimes muscular tremor, lameness, and recumbancy may occur. An edematous occasionally emphysematous swelling forms around the infected wound. In early stages (the swollen tissue is painful, but later becomes cold and insensitive in palpation. A rancid gases with a characteristic rancid or putrid smell fluid exudes wound and from incisions of the swollen tissues, sudden death may occur.

### **Treatment**

Is of little value.

## **Braxy**

**Definition:** It is an acute infectious disease of sheep caused by the toxin of *Cl. septicum* and characterized clinically by inflammation of the abomasal wall, toxemia, high mortality rate, short course and sudden death may occurs.

**Clinical Signs:** Sudden death without previous illness of the affected sheep or the affected sheep isolate themselves, depression , followed by death.

### **Treatment**

Is of little value

## **Blackleg**

**Definition:** It is an acute infectious toxemic disease of cattle and sheep, caused by the toxin of *Cl. chauvoea*, and is characterized clinically by gangrenous emphysematous myositis, severe toxemia and high mortality.

### **Clinical signs**

IP varies from 1-5 days, morbidity rate varies usually up to 20%, mortality rate approaches 100% in untreated animals, short clinical course from 12-48 hours

### **In cattle**

BL is characterized by sudden death without previous illness or the affected animals showing marked depression, weakness, anorexia, high fever 40-42°C, rapid respiration and pulse rate, and appearance of the characteristic signs and lesions, which usually related to the site as in limb muscle involvement is manifested as a lameness with a swelling of the upper part, which at first hot and painful, later becomes cold, painless, emphysematous by palpation crepitation can be felt. A lesion of the tongue muscle results in a tongue and throat swelling with tongue protruding from the mouth and respiratory distress. Lesions of sublumbar muscle manifested by stiffness and reluctance to move is the characteristic. The skin over the lesion is markedly darkened and becomes dry and crack, emitting frothy blood stained material with a rancid odor, death occurs in 12-48 hours.

### **Treatment**

R/Crystalline penicillin I/V followed by long acting preparations.

- Some of antibiotics should be given into the affected tissue.

## **Big Head**

**Definition:** It is acute infectious disease of rams caused by the toxin of *Cl. novyi* type A and characterized clinically by short course and inflammatory edema of the head and neck.

**Clinical Signs:** Sudden death without previous illness or the affected sheep isolate themselves, depression, edematous swelling around eyelids, nose, lower jaw, occlusion of the nasal passages may cause snoring and death.

### **Treatment**

In general is of little value, large doses of penicillin or tetracycline with antitoxin may be used for treating valuable rams.

## **Black Disease**

**Definition:** It is an infectious fatal, toxemic disease of sheep and sometimes cattle, caused by the toxin of *Cl. novyi* type B and characterized by sudden death, liver necrosis, the disease usually associated with fascioliasis.

### **Clinical signs**

#### **1. In sheep**

The morbidity rate usually up to 30 % or more, and mortality rate 100%. The course of the disease usually few hours and the disease is characterized by sudden death without previous illness or animals showed signs of illness for 1-2 hours. The animals segregate themselves from the rest of the flock, fever 41-42°C which drop to normal or subnormal temperature, depression, in-coordinated movements, respiration is rapid and shallow, sternal recumbancy followed by death.

#### **In cattle**

The course is longer, animals showed signs of illness for 1.-2 days, depression, isolate themselves, coldness of the skin, absence of ruminal sounds, low or normal temperature, weakness, muffling of the heart sounds, semi fluid feces, peri-orbital edema may develop and deaths.

### **Postmortem lesions**

The carcass usually showed rapid putrefaction, congestion of subcutaneous tissues with cyanotic venous blood, darkness the hide (Black disease). Blood stained serous fluid in the peritoneal, pleural and pericardial cavities. The liver shows several pale necrotic foci 1-5 cm in diameter, usually in the diaphragmatic surface, there is usually evidence of recent invasion with liver fluke with a channels of damaged liver tissues.

### **Treatment:**

No treatment but vaccination of healthy animals for protection.

## Bacillary Hemoglobinuria

**Definition:** It is an acute infectious highly fatal, toxemic disease of cattle and sheep, caused by the toxin of *Cl. novyi* type D and characterized clinically by high fever, hemoglobinuria, jaundice and necrotic infarction of the liver.

### Clinical signs

IP varies from 7 to 10 days, low morbidity rate usually sporadic, mortality rate up to 25 % or more, the course of the disease usually varies from 12 hours to 4 days. The peracute cases are characterized by sudden death without previous illness. Acute cases are characterized by high fever, complete cessation of rumination, feeding, lactation and defecation. Animals show signs of abdominal pain, pale or icteric mucous membranes, bile or hemoglobin stained feces, hemoglobinuria, shallow rapid respiration and death, pregnant cows may abort.

### Treatment

No response to treatment in sever cases

#### 1- Broad spectrum antibiotic.

R/ Cefotaxime 15 ml/100 kg B.W.

#### 2- Non steroidal anti-inflammatory drugs:

R/ dicloflame 2.5% 4 ml / 100 kg I/M.

#### 3- Supportive treatment

R/ Antoplex (Minerals and Vitamins) 15 ml I/M

R/ Divedry- Ject (AD3E+C) 15 ml I/M.

R/ Saline 0.9% 2-4 Liters للحقن في الوريد



## Tetanus

**Definition:** It is an acute, highly fatal infectious disease of all species of domestic animals caused by *Cl. tetani*.

### Clinical signs

The classical signs of tetanus are nearly similar in all species. In early stages, the animal may continue to eat or drink, but mastication is soon prevented by tetany of the masseter muscle, general stiffness, increase response to external stimuli, reluctance to move, muscle tremors, prolapse of third eyelid, tetanic spasms of the jaw muscles, with restriction of jaw movements, saliva may drool from mouth, ears are erected, tail is elevated, retraction of the eyelids and dilation of the nostrils, constipation and urine retention is usually common. In ruminant typhoid is an early sign.

### Line of Treatment of Tetanus (In Equine)

#### 1- Elimination of the causative bacteria.

##### A- Local treatment:

By irrigation of the wound with hydrogen peroxide and topical application of antibiotic as penicillin, treatment should be continued for 5 days.

##### B- Systemic antibiotic:

R/ Penicillin 3500 IU/KG B.W. I/M every 12 hours for 5-7 days.

#### 2- Neutralization of toxin:

R/ Anti-tetanic serum 60,000 IU (I/V, I/M, & S/C) Daily for 3-5 days.

#### 3- Relaxation of muscle tetany:

R/ Largactil (Chlorpromazine) 0.4 mg/kg I/V.

#### 4- Washing the toxin:

R/ Saline 0.9% 8-10 Liters /24 hours      للحقن في الوريد

#### 5- Non steroidal anti-inflammatory drugs:

R/ Diclofenac 5% 2 ml/100 kg I/M.

**6- Supportive treatment:** If the animal is still able to eat, a soft laxative diet should be provided.

**7- Administration** of enemas and catheterization may relieve the animal's discomfort.

## **Brucellosis**

**Definition:** It is a highly contagious disease primarily of cattle, sheep, goats and camels, caused by Brucella species.

### **Clinical signs**

#### **Cattle:-**

The clinical signs are usually starting with high incidence of abortion in pregnant cows in last 3 months of pregnancy and in subsequent pregnancy. The fetus is usually earned out to full term, although second or even third abortion may occur in the same cows, retention of placenta, metritis, septicemia and death, infertility and sterility troubles area common sequels to abortion. Orchitis and epididymitis in a bull, arthritis and hygromatous swelling of the knee and stifle joint.

#### **Camels:-**

Abortion or stillbirths, bilateral lacrimation, slight lameness and reduced appetite may be observed.

#### **Sheep and goats:-**

Fever, diarrhea, abortion 3-4 month, mastitis, orchitis and arthritis.

### **Treatment**

Unsuccessful because of localization of the organism in lymph nodes, mammary glands and reproductive organs.

### **N.B.**

- 1- Vaccination of all females in the herd (B1).
- 2- Prevent spread of infectious by hygienic measures.
- 3- Eradication of brucellosis in infected herd by test and slaughter of the reactors.

## Listeriosis (Circling Disease)

**Definition:** It is a serious infectious disease caused by *Listeria monocytogenes* and characterized by meningoencephalitis as circling movements, facial paralysis, abortions or septicemia.

### Clinical signs

IP varies from 2-3 weeks, morbidity rate varies up to 20%, mortality rate is low, course of the disease from 2-4 weeks

**(1) Listerial meningoencephalitis:** It is characterized by microabscesses in the brain stem and meningitis occurs most commonly in cattle, sheep and goats and occasionally in horses, dogs and human, the course usually 1-2 weeks and shorter in sheep and calves. This form is characterized clinically by dullness, affected animals isolate themselves, unilateral facial paralysis is a common, with localizing signs as eyelids, ear and lips on the affected side showing a flaccid paralysis sometimes keratitis, corneal ulceration, fever, difficult in prehension and mastication, drooling saliva with food hanging from mouth, the position of head is deviated to one side, death usually occurs due to respiratory failure.

**(2) Listerial abortion:** It occurs in cattle, sheep and goats, and is characterized by abortion or stillbirths usually occurs in cattle at 7 month of pregnancy and in sheep and goats usually at 12 weeks, no signs of meningo-encephalitis, but there is a fever, and sometimes abortion is the only observed without any other clinical manifestation.

### Treatment

#### 1- Antibiotics:

R/ Penicillin 44,000 IU/ kg. B.W. I/M

كل 12 ساعة لمدة 7-14 يوم

Followed by: 22,000 IU/Kg for 7-14 days

Or R/ Ampicilline Or tetracycline.

#### 2- Fluid therapy:

R/ Saline 0.9% 2-3 Liters /24 hours

## Leptospirosis

**Definition:** It is an infectious disease, water born disease caused by leptospirae and characterized by fever, hemolytic icterus, hemoglobinuria and bloody milk, abortion and death.

### Clinical signs

#### Cattle:-

IP is usually 5-7 days, morbidity rate in susceptible herds 50 % and only sporadic cases will occur in endemically infected herd, the fatality rate is usually low 5%, and much higher in calves than in adults, severe form usually fatal 2-10 days.

The clinical signs are pyrexia, anorexia, an acute hemolytic anemia, hemoglobinuria and jaundice. When animals recover there is a prolonged, convalescence period, a necrotic dermatitis may occur in some animals infected with *L. grippotyphosa* and occasional cases may be characterized by signs of meningitis, a synovitis may be occurs.

Discoloration of urine, which varies in color from bright to black. In the mild form the changes are usually transient and the milk becomes normal after several days. There is no inflammation of the udder which usually appears flaccid. Chronic form of leptospirosis are seen commonly in Egyptian buffales and the only signs are bloody milk without any sings of inflammation of the udder.

### Treatment

#### (1) Antibiotic:

R/ Streptomycin 5 g I/M For 14 days

#### (2) Vitamin K ampoules:

R/Amri K 1 amp/70 Kg. B.W. للحقن في العضل يوميا 3 - 5 أيام

#### (3) Source of phosphorus:

R/ Phosophasal inj. 25 ml I/M daily for 5 days.

#### (4) Anthelmintic:

R/Ivermectin super 1 ml/50 kg B.W. S/C.

**ملحوظة:** مشكلة اللين المدمم دائما تحدث في فصل الشتاء ولذلك لا بد من إعطاء مضاد حيوى مع مصدر للفوسفور.

## **Contagious Bovine Pleuro Pneumonia (CBPP)**

**Definition:** It is an acute, subacute or chronic contagious disease of cattle and buffaloes caused by *Mycoplasma mycoides* subsp. It is characterized clinically by fever, cough, nasal discharge and painful respiration.

### **Clinical signs**

IP varies from 3 to 6 weeks or longer, morbidity rate varies and approaches 90%, mortality rate may be high 30-50 %.

In general the signs of CBPP characterized by combination of signs of pneumonia and pleurisy. The acute form sudden onset of fever, dullness, drop in milk production, anorexia, cessation of rumination, rough coat, cough which at first dry and then become moist and painful, expiration may accompanied by grunting.

At percussion, dull sounds can be noticed in the low areas of the thorax, auscultation reveals pleuritic friction sounds in the early stages of acute inflammation and dullness, fluid sounds and moist gurgling crackles in the later stages of effusions.

### **Treatment**

R/ Tylosin 10 mg/kg B.wt. every 12 hours for 3 successive days.

R/ Spiramycin 10-50 mg / kg B.W for 3 days.

### **N.B.:**

In endemic areas, detection and elimination of carriers and subclinical by serological tests as rapid slide agglutination test. The animals considered free from infection after 2 successive negative results of CFT at monthly intervals.

## Haemorrhagic Septicaemia

**Definition:** It is an acute infectious respiratory disease of cattle, buffalo and sheep caused by *pasteurella multocida*.

### **Clinical signs**

IP is short, morbidity rate varies 10-50%, mortality rates are over 50% and may approach 100 %; death occurs within few hours to few days.

The peracute form of the disease is characterized by sudden death after few hours of illness.

The acute form, is characterized by sudden onset of fever (41-42°C), severe depression, anorexia, salivation, increase rate and depth of respiration, moist cough, nasal discharge may be serous to mucopurulent, moist and dry rales by auscultation, development of warm painful, swellings of the head, throat, brisket, perineum and limbs. Severe edema of head and throat may result in dyspnea and death.

### **Treatment:**

#### **1- Non steroidal anti-inflammatory drugs:**

R/ dicloflame 2.5% 4ml / 100 kg I/M.

#### **2-Broad spectrum antibiotics:**

R/Cefotaxime 15ml/100 kg BW. I/V

**Or** Florfinicol injection 4 ml/100 kg B W.

**Or** R/ Borgal (Sulpha and trimethoprim), 3 ml/50 kg I/V, I/M.

#### **4- Supportive therapy:**

R/ Antoplex 15ml I/M

R/ Nuktivitamin (AD3E+C) 15ml/I/M.

#### **5- Antihistaminic:**

R/Antistamin injection 30-40 ml I/V

#### **6- Steroidal anti-inflammatory**

R/ Dexamthasone 10ml I/V

#### **7-Fluid therapy for treatment of dehydration:**

R/ Fluid therapy R/ Saline 0.9% 2-3 Liters /24 hours

## **Tuberculosis**

**Definition:** It is a chronic contagious disease of mammals caused by mycobacterium tuberculosis.

**Clinical signs:** IP varies between about 2 months and several years, the morbidity and mortality rates vary according to cattle rearing system and sometimes, shorter in acute miliary tuberculosis. There are no clinical signs in the early stages of infection. Cattle pulmonary lesions develop a persistent cough, anorexia and loss of body conditions, there may be slight fever. The alimentary form is uncommon, there are few signs but occasional diarrhea occurs, chronic recurrent bloat due to enlargement of mediastinal lymph nodes. Tuberculous mastitis is characterized by indurations of udder supramammary lymph, nodes becomes enlarged, firm and nodular. Infected lymph nodes of the head, neck and fore quarters become enlarged.

### **Treatment**

- Chemotherapy of tuberculosis in domestic animals is of little value because of the chronic nature of the disease and the high costs.
- Control depends on detection and elimination of infected animals.
- Tuberculin testing and slaughter of all reactors.
- Prevention of spread of infection and avoid of further introduction of the disease.

## **Johne's Disease**

**Definition:** It is a chronic infectious disease of ruminants, caused by *Mycobacterium paratuberculosis*, characterized clinically by chronic fatal enteritis, and debilitating diarrhea, progressive emaciation and corrugation of the intestinal mucosa.

### **Clinical signs**

#### **Cattle:-**

In natural infection IP at least 1-2 years, morbidity rate in infected herds usually 1-5 %, the fatality rate is usually high.

The disease is characterized by emaciation usually associated with submandibular edema which has a tendency to disappear as diarrhea develop, drop in milk, no fever, the animal eats well, but thirst is excessive. The feces are soft and thin, diarrhea may be continuous or intermittent, the disease always terminates in severe dehydration, emaciation and weakness.

### **Diagnosis**

1- Field diagnosis: chronic diarrhea, which does not respond to therapy.

2- Laboratory diagnosis: Specimens from alive animal (scraping from rectal mucosa + fecal and serum samples).

3- Isolation and identification: Serological as CFT, ELISA or PCR.

### **Treatment:**

The disease is incurable even by drugs.

### **Control:**

Depends on detection and elimination of infected animals.



## **Actinomycosis (Lumpy Jaw)**

**Definition:** It is acute, subacute and chronic infectious debilitating disease of cattle, caused by *Actinomyces bovis* and characterized by suppurative granulation of the bones of the head particularly the mandible and maxilla.

**Clinical signs:** Actinomycosis in cattle is usually confined to the bony structures. It most frequently affects the bones of the head particularly the lower and upper jaw, the lesions appears as a painless bony swelling which may be diffuse or discrete, very hard, immovable, they usually break through the skin and discharge through one or more openings. The discharge of pus is small in amount and consists of sticky, honey like fluid containing minute hard, yellow-white granules (sulfur granules), in severely affected animals, there is a salivation, reduced appetite, dropping food from the mouth, oral mucosal or tongue lacerations, difficult in mastication with subsequent loss of condition. Actinomycosis may occur in soft tissue such as muscle, lung, liver, stomach, udder or brain and may produce very similar abnormalities in such tissues.

### **Treatment:**

Surgical and medicinal treatment with antibacterial drug

1- Potassium iodide

R/ 6-10 g/day for 7-10 days orally

Or R/ Sodium iodide 1 g/12 kg B.W. 10% I/V.

2- Antibiotic (Penicillin and streptomycin)

R/ Pen strept 4 ml/100 kg B.W. I/M.

يوميًا لمدة أسبوعين

Or Streptomycin 5 g/day for 7 days.

## **Actinobacillosis (Wooden Tongue)**

**Definition:** It is a chronic infectious disease of cattle and caused by *Actinobacillus lignieresii* and characterized by purulent granulomas in soft tissue of the head (especially tongue).

**Clinical signs:** Actinobacillosis has a sudden onset, with excessive salivation, difficult mastication and therefore reduced feed intake. There is considerable submandibular swelling and frequently swollen submandibular and retropharyngeal lymph nodes. The tongue will frequently protrude from the mouth, the tongue will be swollen, hard to the touch and on the surface will be seen round, discrete, yellow lesions 2-5 mm in diameter. These abscesses situated just below the tongue epithelium if left untreated, the disease progresses and eating become impossible and weight loss follow.

### **Treatment:**

Surgical and medicinal treatment with antibacterial drug

1- Potassium iodide

R/ 6-10 g/day for 7-10 days orally

Or R/ Sodium iodide 1 g/12 kg B.W. 10% I/V.

2- Antibiotic (Penicillin and streptomycin)

R/ Pen strept 4 ml/100 kg B.W. I/M.

يوميًا لمدة أسبوعين

Or Streptomycin 5 g/day for 7 days.

## Caseous Lymphadenitis (In Sheep)

**Definition:** It is a chronic infectious debilitating disease of sheep and goats, is caused by *Corynebacterium pseudotuberculosis* and characterized by enlargement and suppuration of one or more lymph nodes, occasionally lungs and spleen.

### Clinical signs

IP long up to 90 days, morbidity rate up to 15 %, low mortality rate, with course varies from months to years. Enlargement and abscessation of one or more of lymph nodes involving superficial (external cutaneous form), and internal nodes and organs (visceral form), especially lungs produce acute bronchopneumonia. Pre-scapular and pre-cural lymph nodes are the most involved and approximately 10 % of the affected sheep discharge a thick green pus.

### Treatment

#### Antibiotic:

R/ Penicilline 1 million I/M/24 h.

حقن في العضل لمدة 5-7 أيام متتالية.

Or Sulfonamides

R/Sulphadimidine 33.3%

Initial dose 200 mg/kg B.wt I/V

Maintenance dose 100 mg/kg B.W. I/V

كل 12 ساعة لمدة 5-7 أيام

**NB:** Local surgical removal for ripening abscesses.

## **Edematous Skin Disease (In Egyptian buffaloes)**

**Definition:** It is a mild contagious disease of buffaloes, caused by coryne bacterium pseudotuberculosis and is characterized by inflammation of subcutaneous lymphatic vessels especially of the lower limbs.

**Clinical signs:**

Swelling and suppuration in one or more of the superficial lymph nodes, general edema in four legs, intra-cutaneous nodules and ulceration of the skin. In acute form, a mild fever, systemic disturbance, painful local edema of one or both fore limbs, slight lameness, enlargement and swelling of the pre-scapular and per-cural lymph node.

In sub-acute and chronic form, appearance of subcutaneous nodules, swelling of lymph vessels and abscess formation along their course of the fore limbs, abdomen and thigh. One or more of these abscesses opened, discharging creamy pus which usually tinged with blood.

**Treatment:**

**I. Surgical treatment:** Local surgical treatment for ripening and evacuation of abscesses ulcers, irrigation with T. iodine.

**II. Medical treatment**

**1-Systemic antibiotic:**

R/ Cefotaxim vial 15 ml/100 kg B.W. حقن عضلى يوميا لمدة 4-5 أيام.

Or

R/ Penicilline 4 million I/M /24 h. حقن فى العضل لمدة 5-7 أيام.

**3-Anti histaminic**

R/Anti-stamin 30-40 ml I/V

**4-Non steroidal anti-inflammatory:**

R/ Dicloprima 5% 2ml / 100 kg I/M.

## **Bovine Farcy**

**Definition:** It is a chronic infectious disease of cattle caused by *Nocardia forcinicus*.

**Clinical signs:**

Early lesions consists of small round hard swellings that are movable under skin but as they enlarged, coalesce and become fixed to the overlying skin. Lesions occur subcutaneously along lymphatics but the major lesions occur at lymph nodes. Typical lesions include chronic indurated subcutaneous swelling and enlargement and thickening of local lymphatics and lymph nodes. Discrete swellings develop along the affected lymphatic vessels and these may rupture and discharge pus through sinuses or from indolent ulcers.

**Diagnosis:**

- 1- Field diagnosis: Depends on signs and lesions.
- 2- Laboratory diagnosis: Samples (purulent discharge or lung lesions). The causative organism is acid fast filaments.
- 3- Histopathology shows the presence of pyogranulomatous dermatitis.

**Treatment and prevention:**

The affected animals should be destroyed.

## **Infectious Bovine Kerato conjunctivitis (Pink-eye)**

**Definition:** It is an acute non fatal infectious disease of cattle, occasionally sheep and other animals, caused by *Moraxella bovis* and characterized by Keratitis, conjunctivitis, lacrimation and development of central corneal edema and a white spot.

**Clinical findings:**

IP is short (2 days), morbidity rate is high, mortality rate is low. Profuse flow of tears, swelling of the eyelid. After 2 days the animal becomes over sensitive to light, the cornea becomes cloudy and the third eyelid become visible. The discharge becomes muco-purulent, blood vessels develop and cover the cornea and produce "pink eye".

**Treatment**

**1-Systemic antibiotic**

R/Florfenicol (Nuflor) 1 ml/15 kg I/M every 48 hours

**2-Local antibiotic:**

R/ oxy-tetracycline                      تقطير العين المصابة مرتين يوميا

**3- Local mixture of corticosteroid and antibiotic (in eye)**

R/ Dexamethasone (1 ml) of mixture of penicilline and streptomycin (2 ml).

**4-Topical anesthetic with Atropin sulfate 2%**

to minimize spasm and pain.

**5-Vitamins &Minerals:**

R/ Vit. AD3E + Vit. C injection.

**N.B.** The affect animal should be placed in a dark shelter out of direct sunlight and adequate vitamin A is provided especially during dry times.

## Contagious Foot Rot

**Definition:** It is an acute or chronic contagious disease of sheep and goat caused by bacteroides nodosus and characterized by sever lameness and bi-digital separation of the hoof corneum.

**Clinical signs:**

Lameness in one or more feet, which varies in degree and may cause carriage of one foot, knee-walking, or recumbancy, swelling and moistness of the skin of the inter-digital cleft with foul-smelling discharge and signs of inflammation. In severe cases, the hoof may slough off and a systemic reaction manifested by anorexia and fever. Chronic cases may be affected for periods of up to 3 years and characterized by presence of moist skin between the claws.

**Treatment:**

**1-Systemic antibiotic (Pencilline/Streptomycin):**

R / Pentomycine 2 ml/50 Kg B.wt I/M for 5-7 days

**2- Steroidal Anti-inflammatory**

R/ Dexamethasone 5 ml I/V.

**3- Supportive therapy (Vitamins)**

R/ Divedry- Ject (AD3E+C) 15 ml/I/M.

**4-Foot path:** All necrotic tissue must be removed and the area must be treated with foot bath (zinc sulphate 10%).

## Salmonellosis

**Definition:** It is a collective description of a group of diseases affecting all animals caused by *S. typhimurium*, *S. dublin*.

**Clinical signs:**

Septicemia are commonly occurs in newborn calves and characterized by high fever (40-42°C), depression, dullness, prostration and death within 24-48 hours. Newborn animals that survive from septicemia usually develop severe enteritis, meningitis, polyarthritis or pneumonia.

In acute enteritis, commonly occurs in adult cattle and occasionally in calves, and is characterized by high fever: which subsides with onset of diarrhea. Severe fluid diarrhea and sometimes dysentery or tenesmus, feces have a putrid smell, contain mucous and fibrinous casts which appear as complete tubular casts or sheets of intestinal mucosa, sometimes blood "passed in large clots". Signs of abdominal pain as rolling, kicking, locking at the flanks, groaning or crouching.

**Treatment:**

**1- Fluid therapy.**

R/ Saline 0.9% 2-4 Liters للحقن في الوريد

**2- Antacid**

R/ Na bicarbonate 1.3% Isotonic 0.5 liter I/V.

للحقن في الوريد لمعادلة الحموضة في الدم.

**3- Broad spectrum antibiotics:**

R/Florfenicol (Nuflor) 1 ml/15 kg I/M every 48 hours.

**4- Non stesiodal anti-inflammatny drugs:**

R/ dicloflame 2.5% 4ml /100 kg I/M.

**5- Supportive therapy (Mineral & Vitamines)**

R/ Antoplex. 5 ml I/M



## Foot and mouth disease

**Definition:** It is a highly contagious, viral disease of cloven footed animals caused by a virus belongs to genus Aphihovirus.

**Clinical signs:**

High fever (40-41°C), for the first 1-4 days, associated with depression, anorexia, cessation of rumination, increased thirst, marked drop in milk production.

Acute painful stomatitis due to vesicles formation, the body temperature returned to normal after rupture of the vesicles, serous nasal discharge, severe ropy salivation with the animal smacking of the lips.

Vesicles may be (1-2 cm) on the mucous membrane of the mouth, tongue, dental pad, muzzle, udder, teats, on the feet (interdigital space and the coronary bad)

Severe lameness, loss of condition, abortion may occur in severe cases.

### Treatment

#### 1-Broad spectrum antibiotic (For secondary infection)

R/oxytetracycline (oxyprema) 15ml/100 kg BW. every 48hr.

#### 2- Non steroidal anti-inflammatory drugs:

R/ Finadyne (Flunixin meglumine) 1 ml/45 kg I/V or I/M.

#### 3- Supportive Treatment

R/ Divedry- Ject (AD3E+C) 15ml/I/M.

R/ Saline 0.9% 2-4 Liters للحقن فى الوريد

#### 4- Local antibiotic and astringent:

Mixture of terramycin, alum and sesem buter on vesicles or ulcers in the mouth.

- دهان الأماكن المصابة بخليط من الطحينية (10 جرام) وتيراميسين (10 جرام) والشبة (2 جرام).

- غسيل الحافر بمركب كيرينات النحاس 5% فم عمل تركيبة من تيراميسين وحمض التانيك والسلفا ثم دهان الحافر بالقطران الطبى.

## Vesicular Stomatitis

**Definition:** It is an infectious viral disease of horses, cattle and swine characterized clinically by vesicles in the oral mucosa, in the skin, over the coronary band and in the interdigital skin of the foot caused by Rhabdoviridae virus.

**Clinical signs:**

High fever associated, with depression, anorexia, cessation of rumination, increased thirst, marked drop in milk production. Painful stomatitis due to vesicles formation which rupture quickly and the resultant irritation causes profuse salivation, lip smacking. The characteristic lesions appear on the mucous membrane of the mouth, tongue, dental pad, muzzle, udder, teats, on the feet especially in interdigital space and the coronary band; severe lameness; lactating cows develop vesicles and ulcer on the udder and teat which predisposing to mastitis.

**Treatment:**

There is no specific treatment, but usually mild antiseptic astringent mouth washes as alum 2% or potassium permanganate 2%.

**Symptomatic treatment:**

**1-Broad spectrum antibiotic (For secondary infection)**

R/oxytetracycline (oxyprema) 15ml/100 kg BW.

**2- Non steroidal anti-inflammatory drugs:**

R/ Finadyne (Flunixin meglumine) 1 ml/45 kg I/V or I/M.

**3- Supportive Treatment**

R/ Divedry- Ject (AD3E+C) 15ml/I/M.

R/ Saline 0.9% 2-4 Liters للحقن في الوريد

**4- Local antibiotic and astringent:**

Mixture of terramycin, alum and sesem buter on vesicles or ulcers in the mouth.

دهان الأماكن المصابة بخليط من الطحينة والتيراميسين والشبة

## **Bovine Ephemeral Fever (Three Day Sickness)**

**Definition:** It is an acute infectious viral disease of cattle and buffaloes, transmitted by insects.

**Clinical finding:**

High fever 40.5-41°C, anorexia, sharp drop in milk production, muscle weakness, shivering and lameness, nasal and watery ocular discharge. Increased respiratory and cardiac rates, clonic muscle movement and weakness in one or more limbs. Some animals standing during the acute stage but the majority becomes recumbent with hind legs sticking out and turned into the flank. Some cases developed pulmonary and subcutaneous emphysema.

**Treatment:**

**1- Non stesiodal anti-inflammatory drugs:**

R/ Dicloflame 2.5% 4ml/100 kg I/M.

**2- Supportive therapy**

R/ Antoplex. 15 ml I/M

R/ AD3E+C 15 ml I/M.

R/ Saline 0.9% 2-4 Liters للحقن فى العضل

**3-Broad spectrum antibiotics:**

R/Oxytetracycline 15 ml/100 kg BW.

تكرر الجرعة كل 48 ساعة 3-5 مرات

**4-Calcium preparation:**

R/ Cal D Mg 1/2 Liter I/V

**N.B**

- The disease occurs in summer months, and the disease is more common in age group of 6-24 months.

## Contagious Ecthyma

**Definition:** It is a highly infectious viral disease of sheep and goats characterized clinically by the development of pustules and scabby lesions on the muzzle and lips.

### **Clinical signs**

In sheep IP from 4-7 days, morbidity rate is usually high, mortality rate is low unless complicated by bacteria or screw worm flies, the course 2 - 4 weeks or longer.

The disease is characterized by appearance of proliferative lesions in the lips, mouth, nose, nostrils, eyelids, udder and sometimes thigh. The lesions start as localized hyperemic and raised areas that quickly developed to papules, pustules and scabs, the rupture of the pustules results in painful ulcers covered with thick brown scab anorexia, body weight loss, affected lambs have difficulty in suckling. Rarely systemic invasion occurs and extends down to the alimentary tract leading to gastroenteritis and diarrhea or down to trachea causing bronchopneumonia.

### **Treatment**

#### **1- Antimicrobial therapy:**

Treatment should be continued for three to five days to avoid secondary infection.

We can use one of the following antibiotics:

R/ amoxicillin, penicillin and streptomycin, or sulpha and trimethoprim.

#### **2- Steroidal Anti-inflammatory**

R/ Dexamethasone 5 ml I/V.

#### **3- Supportive therapy (Mineral and Vitamines)**

R/ Multivitamin AD3E+C 5 ml /I/M.

Antoplex injection 5 ml /I/M.

#### **4- Anti-histaminic drugs**

R/Avil amp. 1 amp./70 Kg Bw./I/M.

**Or** R/ Antistamine 40 ml I/V in cattle.

## Lumpy Skin Disease (LSD)

**Definition:** It is acute infectious serious skin disease of cattle, caused by neethling virus, transmitted by insects.

### Clinical signs:

Sudden onset of fever (40-41.5°C) and persist for up to 14 days (diphasic), in appetite, skin lesion started to appear in the perineum, genitalia, udder and all over the body. These nodules are intra dermal, firm, raised, round or circumscribed, varying in diameter from 0.5-5cm. These nodules may disappear to start again in another part of the body. Sometimes necrosis and slough leaving a large open sores, dry scab may develop after 2-3 weeks, Necrotic foci may appear in the m.m of digestive, upper respiratory and eye causing salivation, nasal discharge, conjunctivitis and keratitis.

### Treatment:

#### 1- Non steroidal anti-inflammatory

R/ Decloflam 2.5% 4 ml./100kg B W.

للحقن في العضل لمدة 3-5 أيام وفي حالة استمرار ارتفاع الحرارة يستخدم نوفالجين بعد عمل كمادات ماء بارد وانخفاض الحرارة تحت درجة 40<sup>5</sup> م

#### 2- Broad spectrum antibiotic

R/ Oxytetracycline L.A 10 ml/100 kg I/M 3 أيام

#### 3- Supportive treatment

R/ Glucose 25% 1-2 L I/V

#### 4- Local therapy

R/ Na bicarbonate 3% دهان على الأماكن المصابة قبل أن تتفجر العقدة

R/ Acetic acid 3% دهان على الأماكن المصابة بعد انفجار العقدة

بعد انفجار العقدة يمكن استخدام مركبات البنسلين كمضاد حيوي.

## Blue Tongue

**Definition:** It is an infectious non contagious, insect borne viral disease of ruminant, specially sheep and occasionally cattle, characterized clinically by fever, emaciation, oral lesions lameness and deaths.

### **Clinical signs**

#### **Sheep**

IP usually less than 1 week, long course, morbidity rate varies 10-50 %, mortality rate 0-20 %. The disease is characterized by fever 41-42°C, frothy salivation, nasal discharge, sometimes stained with blood, inflammation, swelling, hyperemia and cyanosis of the oral mucous membranes especially tongue (Bluetongue), ulceration in and around the mouth, general depression, weakness, lameness, recumbancy due to coronitis and laminitis with appearance of a dark red to purple band in the skin just above the coronet. In pregnant ewes there is abortion, mummification of the fetus, stillbirths, congenital anomalies and dysfunction's in the live newborns. Secondary bacterial infections of respiratory tract, manifested by pneumonia with respiratory distress and gastrointestinal tract manifested by enteritis and diarrhea sometimes bloody stained.

#### **Cattle**

The disease similar as in sheep but is usually subclinical with low morbidity less than 5 % and low mortality less than 1%.

### **Symptomatic treatment:**

#### **1-Broad spectrum antibiotic (For secondary infection)**

R/Oxytetracycline 15 ml/100 kg BW.

#### **2- Non steroidal anti-inflammatory drugs:**

R/ Flunixin meglumine 1 ml/45 kg I/V or I/M.

#### **3- Supportive Treatment**

R/ Divedry-Ject (AD3E+C) 5 ml I/M.

R/ Saline 0.9% 2-4 Liters للحقن في الوريد

#### **4- Local antibiotic and astringent:**

Mixture of terramycin, alum and sesem buter on vesicles or ulcers in the mouth.

دهان الأماكن المصابة بخليط من الطحينة والتيراميسين والشبة

## Rift Valley Fever

**Definition:** It is an acute infectious, arthropod borne, viral disease of domestic ruminants and human.

### Clinical signs

#### Lambs

Short incubation periods (12 hours), fever 41-42°C, restlessness, anorexia, bloody urine, inco-ordination and collapse, death within 24-48 hours, mortality rate up to 90%.

#### Adult sheep

IP varies 24-72 hours, fever 41-42°C for 1-4 days, weakness, bloody urine, bloody diarrhea, blood stained nasal discharge, abortion sometimes the only sign of infection in ewes and may often die without definite signs, mortality rate up to 20-30 %.

#### Cattle and buffaloes

Fever 40- 41°C duration 1- 4 days, drop in milk production, anorexia, abortion is common, catarrhal stomatitis with bucal erosions, excessive salivation and diarrhea, lameness due to laminitis or coronitis.

### Symptomatic treatment:

#### 1-Broad spectrum antibiotic (For secondary infection)

R/Oxytetracycline 15 ml/100 kg BW.

#### 2- Non steroidal anti-inflammatory drugs:

R/ Butafunil 2 ml/100 kg B.W. I/M.

#### 3- Supportive Treatment

R/ Multivitamin (AD3E+C) 15 ml I/M.

R/ Saline 0.9% 2-4 Liters للحقن في الوريد

#### 4- Local antibiotic and astringent:

Mixture of terramycin, alum and sesem buter on vesicles or ulcers in the mouth.

دهان الأماكن المصابة بخليط من الطحينة والتيراميسين والشبة

### Prevention and control:

Immunization of the animals with live attenuated vaccine used after reconstitution with saline solution. Single inoculation induce protection in 6-7 days which lasts many years.

## **Bovine viral Diarrhea** **(Mucosal Disease Complex)**

**Definition:** It is an acute or chronic infectious viral disease of cattle caused by small RNA Virus of genus pestivirus.

**Clinical signs:**

**A- Acute fatal syndrome:** fever 40-41°C and depression, anorexia, weakness, cessation of rumination, increased heart rate and respiration, salivation, profuse watery diarrhea occur 2-4 days from the onset of the clinical signs. The feces are foul smelling and may contain mucus or blood, erosions and ulcers on the oral, alimentary tract mucosa, muzzle, nostrils and pharynx, mucopurulent nasal discharge, lameness due to laminitis, corneal opacity begins in the center and extends outwards pregnant females may abort, dehydration and death occurs after 5-8 days from the onset of signs.

**Treatment:**

There is no specific treatment, but usually mild antiseptic astringent mouth washes as alum 2%, potassium permanganate 2%.

**Symptomatic treatment:**

**1-Broad spectrum antibiotic (For secondary infection)**

R/Oxytetracycline 15 ml/100 kg BW.

**2- Non steroidal anti-inflammatory drugs:**

R/ Dicloflam 2.5% 4 ml/100 kg B.W. I/M.

**3- Supportive Treatment**

R/ Divedry- Ject (AD3E+C) 15ml I/M.

R/ Saline 0.9% 2-4 Liters للحقن في الوريد

**4- Local antibiotic and astringent:**

Mixture of terramycin, alum and sesem buter on vesicles or ulcers in the mouth.

دهان الأماكن المصابة بخليط من الطحينة والتيراميسين والشبة.

## **Cow and Buffalo Pox (CBP)**

**Definition:** CBP is a benign contagious viral disease of cattle, buffaloes and humans.

**Clinical signs**



IP from 3-6 days, morbidity rate relatively high, mortality rate is too low, the course of the disease usually 3-6 weeks. The initial signs may be irregular prodromal fever or no systemic disturbance. In both species, the typical pox lesions may be seen at any stage of development, macula, papule, vesicles, pustule and scab formation, the common sites of the lesions are teats, udder, perineum and inner thighs. The common sequel in lactating cows are thickening of teats with deep ulceration without scab formation, stenosis of the milk ducts and mastitis. Suckling calves may develop lesions around the mouth.

### **Treatment**

#### **1- Antimicrobial therapy:**

Treatment should be continued for three to five days to avoid secondary infection.

#### **We can use one of the following antibiotics:**

R/ Amoxicillin, penicillin and streptomycin, or sulpha and trimethoprim.

#### **2- Steroidal anti-inflammatory**

R/ Dexamethasone 5 ml I/V in sheep.

#### **3- Supportive therapy (Mineral and Vitamins)**

R/ Antoplex injection 5 ml I/M in sheep.

#### **4- Anti-histaminic drugs**

R/Avil amp. 1 amp./70 Kg B.W. I/M.

## Pseudo Cow Pox

**Definition:** It is a benign infectious viral disease of cattle and humans.

### **Clinical signs**

IP about 6 days, morbidity rate varies from 5-10 % and occasionally higher, no mortality, the course of the disease from 6-8 weeks.

Acute and chronic form according to the lesions which only seen in the skin of teats of lactating cows. Acute lesions started as erythema followed by development of vesicle or pustule which ruptures after 48 hours resulting in a formation of thick scab, pain is present only in the prescab stage. The scab varying in size from 0.5-2.5 cm in diameter, becomes markedly elevated, 7-10 days after lesions appear the scab drop off, leaving a horseshoe shaped ring of small, scabs surrounded by a wart like granuloma which may persist for months, the disease tends to disappear from a herd after 18-21 days but may recur cyclically about a month later.

### **Treatment**

#### **1- Antimicrobial therapy:**

Treatment should be continued for three to five days to avoid secondary infection.

We can use one of the following antibiotics:

R/ amoxicillin, penicillin and streptomycin, or sulpha and trimethoprim.

#### **2- Steroidal Anti-inflammatory**

R/ Dexamethasone 15 ml I/V.

#### **3- Supportive therapy (Mineral and Vitamins)**

R/ Divedry-Ject (AD3E+C) 15 ml I/M.

#### **4- Anti-histaminic drugs**

R/Avil amp. 1 amp. /70 kg B.W.. I/M.

## Sheep and Goat Pox

**Definition:** It is a highly contagious viral disease of sheep and goats caused by Capripox virus, related to Neethling lumpy skin disease virus.

**Clinical signs:**

Fever, depression, anorexia, lacrimation, salivation and nasal discharge, rough hair coat, arched back, papules developed in un-wooled areas of the skin, groin, scrotum, ventral aspect of tail, eyelids, lips, cheeks, nostrils and udder: At first they are circumscribed edematous and hyperemic, which pustules later as the surface of pustules dry out, a thin scabs that gradually darkness is developed.

**Treatment:**

**1- Antimicrobial therapy:**

Treatment should be continued for three to five days to avoid secondary infection.

We can use one of the following antibiotics:

R/ amoxicillin, penicillin and streptomycin, or sulpha and trimethoprim.

**2- Steroidal Anti-inflammatory**

R/ Dexamethasone 5 ml I/V.

**3- Supportive therapy (Mineral and Vitamines)**

R/ Divedry-Ject (AD3E+C) 5 ml I/M.

**4- Anti-histaminic drugs**

R/Avil amp. 1 amp. /70 Kg B.W. I/M.

## **Malignant Catarrhal fever (MCF)**

**Definition:** It is an acute, highly fatal infectious viral disease of cattle, buffaloes and deer, caused Gamma herpes, one (AHV-1), characterized by stomatitis, gastroenteritis and kerato-conjunctivitis.

### **Clinical signs:**

**In per-acute form** signs may be limited to severe inflammation of the oral and nasal mucosa and hemorrhagic gastroenteritis and death of cattle after 3-4 days.

**Acute form** is characterized by sudden onset, fever (40-42°C), nasal ,ocular discharges progressing from serous to mucopurulent and purulent, depression, anorexia, marked drop in milk production, obstruction of nasal passages leads to dyspnea, open mouth breathing, fetid saliva drools from the mouth. Signs of ophthalmia include lacrimation, purulent exudation, photophobia, hyperemia, edema of conjunctiva and corneal opacity. In addition, encephalomyelitis is often manifested by muscular tremors, inco-ordination, torticollis and aggressive behavior, diarrhea, dysentery dermatitis, laminitis and skin lesion may occur.

### **Treatment**

Symptomatic treatment of little value.

### **Prevention and control measures:**

Cattle and other susceptible species should be kept separated from potential reservoir species such as sheep, goats and wildebeest.

No vaccine are available to protect cattle against (MCF).

## **Infectious valvo-vaginitis (IPV) in cattle**

This form is more common in a dairy herds, in most cases pustular and necrotic lesions are developed on the mucosa of. the vulva, vagina, the cows showed signs of pain, arches her back, frequently urination, vulva is swollen, with yellow discharge from the vulva, small white pustules are present inside the vulva, and on the walls of the vagina, drop of milk production, loss of appetite, recovery after 3-4 weeks.

### **Infectious pustular balanoposthitis (IPB) In Bulls**

The infected bulls develops pustules and inflammation on the inner lining of the sheath, prepuce and sometimes on the glans penis, producing balanoposthitis, the sheath becomes swollen with pustules and inflammation, orchitis, if infected bull serve clean cow it will be infected and vice versa.

#### **Treatment:**

#### **Symptomatic Treatment:**

#### **1- Non steriodal antimflammatny drugs:**

R/ Tolfin 1 ml/20 kg I/M, I/V.

#### **2-Broad spectrum antibiotics**

R/Cefotaxime 15 ml/100 kg B.W. I/V

#### **3- Supportive therapy**

R/ Antoplex. 15 ml I/M

R/ Divedry- Ject (AD3E+C) 15 ml I/M.

#### **4-Fluid therapy for treatment of dehydration**

## Enzootic Bovine Leukosis

**Definition:** It is a highly fatal systemic malignant neoplasia of the reticulo-endothelial system of cattle and buffaloes, caused by bovine leukemia virus.

**Clinical signs:**

Clinical signs in animals that develop tumors depend on the particular organ or organs involved as one or more superficial lymph nodes may be enlarged and these can be felt as lumps beneath the skin especially in the neck and hind flank areas. However, when the internal lymph nodes are the only ones affected, diagnosis may be more difficult.

Tumors can occur in abomasum (manifested clinically by impaired digestion resulting in persistent diarrhea and chronic bloat), right side of the heart (manifested clinically by congestive heart failure with hydro-pericardium and muffling of the heart sounds, engorgement of jugular veins, hydrothorax and edema of brisket).

**Diagnosis:**

1-Field diagnosis:

-Clinical evidence of lymphadenopathy or tumor.

2- Laboratory diagnosis:

-Virus isolation, histopathological examination.

-Serological examination on serum or milk samples.

-An autopsy of tumor, can be demonstrated by PCR.

**Treatment**

No treatment and positive reactions should be discarded.

## **Infectious Bovine Rhinotracheitis (IBR)**

**Definition:** It is a highly infectious disease of cattle and buffaloes caused by bovine herpes virus 1.

### **Clinical signs:**

**I-Respiratory form:** Sudden onset of fever (40-42°C) and acute inflammation of the upper respiratory tract, serous nasal and ocular discharge, shallow rapid respiration, persistent cough. Bronchopneumonia is the end results for complicated cases which characterized by change of the character of nasal discharge from serous to mucopurulent and a "diphtheritic membrane" from over the nasal tracheal mucosa and sometimes over the muzzle, there is hyperemia, edema and hemorrhagic focal necrosis of the nasal mucosa (red nose).

**II-Ocular form:** It is manifested by bilateral conjunctivitis, keratoconjunctivitis, exudation progresses from serous to mucopurulent and there may be photophobia.

### **Symptomatic treatment:**

#### **1- Non steriodal anti-inflammatory drugs:**

R/ Diclofenac Na 2.5% 4 ml 100 kg I/M.

#### **2-Broad spectrum antibiotics**

R/Cefotaxime 15 ml/100 kg B.W. I/V

#### **3- Supportive therapy**

R/ Antoplex. 15 ml I/M

R/ Divedry-Ject (AD3E+C) 15 ml I/M.

**N.B.:**Intra-nasal vaccination by modified live virus vaccine which stimulate production of local interferon and local antibody in the nasal and mucous membranes, such as nasal gene.

## **Bovine Babesiosis**

**Definition:** BB is an acute, subacute or chronic infectious disease of

cattle and buffaloes, caused by four species of Babesia and transmitted by ticks.

**Clinical signs:**

Clinical symptoms varies according to the degree of parasitaemia. The disease characterized by sudden onset of high fever up to 40-42°C, dullness, depression, weakness, cessation of rumination, respiration and heart rate accelerated, the mucous membrane is congested first, but very soon becomes pale and in terminal stages it becomes icteric. The urine is dark red to brown in color and sometimes produces a very stable froth, pregnant animals may abort, muscular tremor, cold extremities and difficult breathing accompanied by subnormal temperature are signs of approaching death.

Infected animals may end terminally with CNS signs (Cerebral Babesiosis).

**Line of Treatment of Babesiosis**

**1- Antiprotozoal drugs:**

R/ Batrinil 7% 1 ml/20 kg. B.W. (1.05 g vial dissolved in 12.5 ml water I/M or S/C injection).

**Or** R/ Imisol 12% 1 ml/100 kg B.W. S/C injection.

**2- Blood transfusion:**

In heavy infestation and low PCV, blood transfusions is indicated in a dose rate of 7 ml/kg B.W. (heparinized blood).

**3- Non stesiodal anti-inflammatory drugs:**

R/ Dicloperma 5% 2 ml/100 kg B.W. I/M.

**4- Supportive Treatment**

R/ Antoplex (Minerals & Vitamins) 15 ml I/M

R/ Saline 0.9% 2-4 Liters                      للحقن فى الوريد



## Tropical Theileriosis

**Definition:** TT is an peracute, acute, subacute, chronic infectious disease of cattle and buffalo, caused by Theileria annulata, transmitted by ticks and characterized by fever, enlargement of peripheral lymph nodes, wasting, progressive anemia and jaundice.

**Clinical signs:**

Peracute form occurs in completely susceptible animals entering endemic areas. The animals develop marked pyrexia with anorexia, depression and weakness and die in three or four days.

Acute form is most commonly seen in susceptible animals move into endemic areas and in marginal areas of tick activity. The animal develop pyrexia, which may persist for several days, it is accompanied by inappetence, lethargy, skin lesions, corneal opacity, swelling of the superficial lymph nodes, oculo-nasal discharge, respiratory distress and ruminal stasis. This is followed in a few days by anemia, pale mucous membranes, and a rapid heart rate. Constipation is common when pyrexia first occurs, but later there is diarrhea and blood stained feces.

**Line of treatment:**

**1-Anti-Theileria drugs:**

R/ Butalex 1ml/20 kg I/M

تحقن في العضل جرعة واحدة ويمكن ان تكرر الجرعة بعد 48 ساعة من الجرعة الأولى في الحالات الشديدة

**Or Broad spectrum antibiotics**

R/Oxytetracycline 15ml/100 kg BW.

تكرر الجرعة كل 48 ساعة 3-5 مرات

+ R/ Arsenal injection. 10 ml/100 kg BW I/M.

تكرر الجرعة لمدة 5 ايام فقط

**3- Non steroidal anti-inflammatory drugs:**

R/ Tolfin (Tolfinac acid) 1 ml/20 kg I/V or S/C.

**4- Supportive therapy**

R/ Antoplex. 15 ml I/M

R/ Divedry- Ject (AD3E+C) 15 ml I/M.

R/Immuno-stimulant(Vitamin E+Selenium) 10 ml/ 100 kg B.wt

للحقن في العضل يوميا لمدة 3 ايام.

## Anaplasmosis

**Definition:** it is a tick born disease of cattle, sheep, goats, buffalo and wild ruminants, caused by Rickettsia, anaplasma species, transmitted by licks.

### Clinical findings:

Incubation period varies from 3-4 weeks.

In a cute form, fever 41°C, anemia and weakness, depression, anorexia, dehydration and labored breathing. Lymph nodes are enlarged, jaundice in some animals, abortion in some cows and temporary loss of infertility in bulls.

### Treatment:

#### 1- Antiprotozoal drugs:

R/ Batrinil 7% 1 ml/20 kg B.W. (1.05 g vial dissolved in 12.5 ml water I/M or S/C injection).

Or R/ Imizol 12% 1ml/100kg S/C injection.

#### 2- Non steroidal anti-inflammatory drugs:

R/ dicloflame 2.5% 4ml / 100 kg I/M.

#### 3- Supportive therapy

R/ Antoplex 15 ml I/M للحقن فى العضل

Or Multivitamins (AD3E+C) 15 ml I/M. للحقن فى العضل

R/ Saline 0.9% 2-4 Liters للحقن فى الوريد

## **Toxoplasmosis**

### **Clinical signs**

**In sheep:** Signs of encephalitis including, circle waking , in-coordinated movements, muscular rigidity and prostration, with oculitis, impaired vision and altered papillary reflexes and with metritis and placentitis, they abort during the last month of pregnancy or bear stillborn and weak lambs. Congenitally infected lambs are mentally dull, physically weak, muscularly incoordinated, and unable to nurse. Death results from starvation.

**In cattle:** The disease runs usually an acute course with fever, dyspnea, and nervous signs, including ataxia and hyper-excitability, in the early stages, followed by extreme lethargy, stillborn or weak calves which die soon after birth. Toxoplasmosis appears to play no significant role in bovine abortion. Congenitally affected calves show fever, dyspnea, coughing, sneezing, nasal discharge, clonic convulsions, grinding of teeth and tremor of the head and neck. Death occurs after a course of 2-6 days.

### **Treatment:**

Administration of full doses of sulfa (sulfadiazine, sulfadimidine) combined with pyrimethamine in sheep and cattle during early stage of infection may be effective against the proliferative parasites in acute stage of the disease.

## Mange

**Definition:** It is a chronic infectious disease of all domestic animals caused by pathogenic species of mites and characterized by dermatitis, and itching of the skin.

### **Clinical signs**

In general, there is itching, erythema of the skin, formation of scales and thickening of the skin folds, alopecia, fissure and cracks may be seen, general weakness and bad condition.

### **Diagnosis**

Depends on detection of the causative mites in skin scraping by a low power of the microscope by direct examination after digestion of the scraping in warm 10% potassium hydroxide solution.

### **Differential diagnosis**

Mange may be mistaken with any other condition characterized by skin lesions as in ring worm and photosensitization.

### **Prognosis**

Favorable.

### **Treatment**

1- Anti-parasitic Drug (Ivermectine):

R/Univomic 1 ml/50 kg B.W. S/C

Or Spray as butox 1 ml/1 Liter (Spray).

2-Anti-histaminic:

R/Antistamine 40 ml I/V.

3- AD<sub>3</sub>E vitamin injection 15 ml I/M cattle.

5 ml I/M sheep.

1 ml I/M dog and cat.

## Warble

**Definition:** It is a chronic infectious disease primarily of cattle, occasionally of equine caused by infestation with the larvae of *Hypoderma* species, causing serious damage to CNS skin and toxemia.

### **Clinical signs**

Unthriftiness, decreased milk yield, poor growth and condition, the presence of larvae causes obvious swelling with pain on touch. The swellings are usually soft and fluctuating and about 3 cm in diameter. Posterior paralysis without fever, in case of involvement of the spinal cord.

### **Diagnosis**

A) Field diagnosis: Clinical signs are diagnostic and no other diseases causes the characteristic swelling on the back.

B) Laboratory diagnosis: Skin biopsy from the lesions may be helpful for detection of larvae in the swelling on the back.

### **Treatment**

1. Organophosphorous insecticides such as diazinon 1 ml/liter.

Or R/ Butox 1 ml/liter water spray on the skin

2. Ivermectine

R/ Iver-plus 1 ml / 50 kg S/C

3- Antihistaminic drug:

R/Avil ampoule 1 ampoule/70 Kg B.W. I/M

## **Screw Worm Myiasis (Screw Worm infestation- myiasis)**

**Definition:** It is a chronic infectious disease affect all domestic and wild worm blooded animal caused by infestation of fresh wounds by the larvae of screw worm and characterized by a profuse brownish exudates pours from the wounds.

### **Clinical signs**

The young larvae invade the surrounding tissues vigorously and feed on necrotic superficial tissue. A profuse brownish exudate pours from the wound and an objectionable odor is apparent, which is highly attractive to other flies and multiple infestations of a single wound may occur within few days. The resulting tissues damage may be so extensive that the animal is virtually eaten alive. Affected animals show irritation early after infection and by day 3 show pyrexia.

### **Diagnosis:**

A- Field diagnosis: clinical signs are diagnostic.

B- Laboratory diagnosis: larvae (10-12 L), from deep lesions are collected in a screw capped bottle with ethyl alcohol 70% or formalin 10%.

- Clipping of the hair or wool around the wound area.
- Removing of the larvae and debris from the wound and dressing with antiseptic solution.

### **Treatment**

#### **1. Organophosphorous insecticides**

R/ Butox 1ml/liter water spray on the skin

#### **2. Ivermectine**

R/ Ivermectine super 1 ml/50 kg B.W. S/C

#### **3-Antihistaminic drugs:**

R/Avil ampoule (1 ampoule/70 kg B.W. I/M).

## Nasal Myiasis

**Definition:** It is a chronic rhinitis and sinusitis of sheep, caused by invading maggots, and characterized by persistent restlessness and muco-purulent nasal discharge.

**Clinical signs:**

Morbidity may reach 80 % of the flock, but mortality is very low. The course of adult fly attack periodically extends through the summer, and rhinitis sinusitis continue up to 10 months. Sheep attacked by ovipositing flies stamp their feet, shake their heads, sneeze below and rub their noses against the ground or other sheep. The animals also keep cool areas, such as dump shade frequent. During the time, the larvae occupy the nose and sinuses. Affected sheep may hold their heads towards the ground and persistently discharge muco-purulent exudates from the nostrils. Breathing may be difficult because of swollen nasal membranes and plugged nostrils.

**Diagnosis:**

A- Field diagnosis: Restlessness and frenzied behavior of sheep during hot mid days and observing the furtive flies.

B- Laboratory diagnosis: The diagnosis is confirmed by finding and identification of larvae in the sinuses.

**Treatment:**

**Ivermectin:**

R/ Iver plus 2 ml/50 kg B.W. S/C injection one dose.

ملحوظة مهمة:

زيادة الجرعة الى الضعف فى هذه الحالات يودى الى تحسن ملحوظ .

**Or** R/Nitroxynil (Dovenix-Distomicide-Fasciolid) 1ml/25 kg B.W. S/C.

**Control:**

Control can be achieved by treatment in late summer to prevent the build up of heavy infestations and in winter to remove the over wintering larvae.

## **Fascioliasis**

**Definition:** It is a acute, subacute or chronic infectious disease of liver and bile ducts of cattle, buffalo, sheep, goats and other animals caused by *Fasciola gigantica* and *F. hepatica* and characterized by chronic digestive and nutritional disturbance, often masked by destruction of liver.

### **Clinical signs**

In acute disease due to massive invasion and migration of large numbers of immature liver fluke through the liver, characterized by sudden death without previous illness.

In sub-acute form, anemia, weight loss, pale mucous membranes and sub-mandibular edema may be observed only in few cases.

In chronic disease, progressive loss of condition, edema specially in sub-mandibular space (bottle jaw), pale or ictric mucous membranes, in sheep shedding of the wool may occur, decrease milk production and diarrhea is common in cattle.

### **Treatment**

R/ Dovenx (Nitroxynil) 1 ml/25 Kg B.W. S/C.

Or R/Distomicide (Nitroximil) 1 ml/25 Kg B.W. S/C.

You can use another drugs such as:

Fasciolid-Rafoxanide, Zanil, Ivermectin super, Iver-plus.

### **N.B.:**

- Most drugs are highly efficient against mature flukes but not on immature, so drug should be repeated after one month.
- Relative lack of toxicity is essential because of the already impair deficiency of hepatic detoxicating.
- Glucose 25% is better injected before administration of the drug specially in heavy infested and weak animals to avoid sudden death.



## Paramphistomiasis

**Definition:** It is acute, parasitic infectious disease of domestic ruminants, caused by massive infections by the immature stages of the duodenum causing hemorrhagic duodenitis manifested clinically by fetid diarrhea, anorexia, marked loss of condition, progressive weakness, lead to recumbency and death.

### **Clinical signs**

The morbidity and mortality rates vary, but usually high. In acute infestation, due to massive invasion by immature fluke, there is a persistent fetid diarrhea without blood or mucus. There is anorexia, weakness, marked loss of condition and then recumbancy. In some cases there is sub-maxillary edema, and pale mucous membranes. Death usually occurs after 1-2 weeks from appearing of the first signs.

In Chronic infestation, there is a chronic loss of weight, a dry coat, anemia and recurrent diarrhea.

### **Line of treatment**

#### **1- Anthelmintic drug**

R/Zanil (30 ml/100 kg) with maximum dose 105 ml orally.

Or

R/Niclosan 30 tablet / orally

Or

Mansonil (Niclosmide) 1.2 g/10 kg B.W.

#### **2- Intestinal antiseptic and astringent**

R/Sulfaguanidine 10 g/100 kg B.W. orally.

R/Tannic acid 10 g/100 kg B.W. orally.

#### **3- Coating:** starch 0.5 kg for cattle orally.

## Filariasis

**Definition:** It is a chronic infectious disease complex of domestic animals caused by filarial nematodes.

### Clinical signs

The morbidity varies directly with the degree of infestation in the grazing land, and mortality may reach 20%. The course may extend through several months.

### Forms of filariasis

**1-Filarial dermatitis:** It is characterized by hemorrhagic dermatitis, nodules on the head, neck, withers oozing a bloody exudates.

**2-Cutaneous stephanofilasosis:** skin lesions appears as a papular dermatitis, which becomes exudative, the skin becoming dry and thickened.

**3-Onchocercosis:** It is common in equines, and characterized by alopecia, pruritis between forelegs and ventral abdomen, high abdominal wall, face, neck and thorax. Fistulous withers (inflammation of the ligamentum nuchae). Affected horses are lame while the area is edematous and swollen.

### Treatment

#### 1-Anthelemic drugs:

R/ Iver plus 1 ml / 50 kg S/C

للحقن مرة واحدة تحت الجلد

#### 2-Diuretic:

R/Lasix injection 1 amp/70 kg B.W. I/V or I/M

#### 3-Non steroidal anti-inflammatory:

R/Tolfine 10 ml/100 kg I/V.

## Tapeworm infestation

**Definition:** It is a chronic infectious disease of young animals caused by heavy infestation with tapeworm.

**Etiology:**

The common tape worms of ruminant are *Moniezia*, *Avitellina*, *Stilesia* spp. In equines, *Anoplocephala* and *paranoplocephala* spp.

**Clinical signs:**

Unthriftiness, poor coat, digestive disturbances including constipation, mild diarrhea and dysentery and sometimes anemia.

**Diagnosis:**

1- Field diagnosis: Based on the age of the diseased lambs or foals usually less than 6 months. Signs of digestive disturbances, the diagnosis is confirmed by presence of worms during postmortem examination or presence of proglottides in the feces.

2- Laboratory diagnosis: A positive diagnosis depends upon finding large numbers of thick walled, embryonated eggs by floatation techniques.

**Treatment**

R/Niclosan 100/mg/Kg orally.

Or

Mansonil (Niclosmide) 1.2 g/10 kg B.wt.

**Prevention and control**

- 1- Control of the mites which act as intermediate hosts.
- 2- Periodic dosing of young animals particularly during summer and autumn in endemic area.

## Coenurosis (in sheep)

**Definition:** It is a disease caused by invasion of the brain and spinal cord by the intermediate stage of *Taenia multiceps*.

**Clinical signs**

In acute outbreaks due to migration of larval stages, sheep, show varying degrees of blindness, ataxia, muscle tremors, nystagmus, excitability and collapse.

Sheep affected with mature coenurus show an acute onset of irritation phenomena including a wild expression, salivation, frenzied running and convulsions, deviation of the eyes and head, some animals may die at this stage, but the earlier proportion go to the second stage of loss of function phenomena, which include partial or complete blindness in one eye, dullness, clumsiness, head pressing, ataxia, incomplete mastication and periodic epileptiform convulsion, are usual signs. Deviation of the head and circling, there is rotation of the head with the blind eye down and the deviation of the head with circling in the direction of the eye blind, when the spinal cord is involved. There is gradual development of paresis and eventually inability to rise. Death usually occurs after a long course of several months.

**Treatment:** No treatment and Slaughter the infested sheep.

**NB.**

**Prevention and control of parasitic diseases**

- 1- Prophylactic use of anthelmintics twice annually in dog to reduce both the number of flukes in animals and the number of eggs excreted.
- 2- Prevent animals from grazing infected pasture.

## **Dermatophilosis**

**Definition:** It is an acute or chronic infectious disease of cattle, sheep and horses, caused by *Dermatophilus congolensis* and characterized by exudative pustular dermatitis give rise to formation of dense scabs on the skin.

**Clinical signs:** Lesions occur on the neck, body or back of the udder may extend over the sides and down the legs and the ventral surface of the body. The characteristic lesions are thick, horny crusts, varying in color from cream to brown. They are 2-5 cm in diameter and are often in such close opposition that they give the appearance of a mosaic. In the early stages the crusts are very tenacious and attempts to lift them cause pain. Beneath the crusts there is granulation tissue and some pus. In later stages, the dermatitis heals and the crusts separate from the skin but are held in place penetrating hairs or wool fibers and easily removed. In calves, plaque and crust formation do not occur. There is extensive hair loss with tufting of the fibers, heavy dandruff and thickening and folding of the skin in later stages, vesicular and pustular lesions 1 cm in diameter have also been described in the early stages of the disease. In calves lesions usually commence on the muzzle and spread over the head and neck.

### **Treatment**

#### **1- Antibiotic:**

R/ Single large dose of combined penicillin (70000 IU/kg B.W. and streptomycin (70 mg/kg B.W.).

Or Oxyprema L.A. 15 ml/100 kg. B.W.

**2- Removal of scabs** with brush and mild soap before daily topical application of iodine compounds, or copper sulphate 0.2% solution.

#### **3- Multivitamins:**

R/AD3E 15 ml I/M for 4 days.

# DIFFERENTIAL DIAGNOSIS

## I. Differential diagnosis of cattle diseases

### 1. Infectious diseases causing abortion in cattle

- 1-Brucellosis:** abortion occurs usually at late stages of pregnancy and there is a subsequent high rate of infertility in the female and varying degrees of infertility in the males. The placenta is usually edematous and has leathery plaques on external surface of the chorion and necrosis of the cotyledons. In fetus there may be pneumonia.
- 2-Trichomoniasis:** abortion occurs at 3-4 months of pregnancy (5-30%), heat periods may be missed, endometritis, yellow-white mucopurulent flecks of pus, sometimes watery exudates with tarry white flucules, the pus is not viscous but has low cohesive properties, odourless vaginal discharge.
- 3-Leptospirosis:** abortion occurs at late stage of pregnancy with yellow-brown cotyledons, brown gelatinous edema between placentas and amnion.
- 4-Vibriosis:** abortion occurs at 3-6 months of pregnancy, dead fetuses, endometritis, weak and premature calves.
- 5- Mycotic abortion (Aspergillus):** abortion occurs at 3-7 months of pregnancy, cases of pneumonia in herd often two to four days after abortion, fetal membranes are dark red or tan between the cotyledons, dark red patches several centimeters in diameter between the cotyledons covered with yellowish pseudo-membranes.
- 6- Salmonellosis:** in adult cattle, reduction of milk production - high temperature - rolling gait - spasms -trembling of muscles - salivation - frothing at mouth - blood in feces followed by stinking diarrhea with

threads of mucous membrane -wasting - death - if death does not occur , diarrhea - emaciation -wasting - abortion .In P.M. lesions, inflammation of intestines -hemorrhages in mucous membranes - inflammation and thickening of gall bladder- enlarged and degenerated liver and intestinal lymph nodes.

**7-Toxoplasmosis:** subclinical signs usually occur. In acute form excitability- depression - staggering - muscular tremors - fever - rapid breathing and nasal discharge.

**8-Rift Valley fever:** has short incubation period (12 h) - high mortality within 36 h in 70% in young calves. In adults, abortion is the outstanding sign and mortality is 10%.

**9-Infectious bovine rhinotracheitis - infectious pustular vulvovaginitis:** caused by BHV-1 which can become latent following strain. Abortion occurs some weeks after the clinical illness and can be occurred up to 90 days following vaccination if the virus becomes latent in the placenta. The fetus is autolyzed and foci of hepatic necrosis.

**10- Bovine virus diarrhea/Mucosal disease:** abortion - infertility - neonatal anomalies - necrotic erosions in the mouth - salivation -nasal discharge - severe diarrhea.

**11- Listeriosis:** Abortion at 7 months (sporadic) - clinical features are may be associated septicemia. Foci of necrosis in liver and other organs and fetal autolysis.

## **2. Infectious diseases causing sudden death:**

**1- Anthrax:** characterized by septicemia and sudden death accompanied by the exudation of tarry blood from the body orifices, absence of rigor mortis and splenomegaly.

- 2- **Blackleg:** It is an acute, infectious disease caused by *Clostridium chauvoei* and characterized by inflammation of skeletal and cardiac muscles, severe toxemia and a high mortality.
  - 3- **Bacillary hemoglobinuria:** an acute, highly fatal toxemia of cattle and sheep characterized by a high fever, jaundice, hemoglobinuria and the presence of necrotic infarction in the liver.
  - 4- **Acute fascioliasis:** characterized by badly damaged, swollen liver. The capsule shows many small perforations and subcapsular hemorrhages. The parenchyma shows tracts of damaged tissue and is much more friable than normal.
  - 5- **Coliform mastitis:** occurs almost entirely in the lactating cow and rarely in the dry cow. Cows with known uninfected quarters at drying-off developed peracute coliform mastitis at calving which suggests that infection occurred during the dry period.
  - 6- **Malignant edema (Gas gangrene):** an acute wound infection of cattle, sheep and horses caused by genus *Clostridium*. Acute inflammation at the site of infection - profound systemic toxemia and death within 24-36 hours.
  - 7- **Enterotoxemia in calves and sheep:** caused by *Cl. perfringens* type A, B, C and D. High temperature, depression, collapse, mucosal palor, jaundice, hemoglobinuria, dyspnea, severe abdominal pain and death within 12 hours.
  - 8- **Rift Vally Fever in calves:** sudden onset of high fever -incoordination - collapse - death within 36 hours - extensive hepatic necrosis.
  - 9- **Foot and Mouth Disease in calves:** epicardial hemorrhages -with or without pale areas in the heart. Histologically, tiger heart appearance.
- 3. Infectious diseases causing oral lesions and diarrhea:**



- 1- **Rinderpest:** high morbidity and mortality rates, erosive stomatitis, gastroenteritis and zebra marking in colon.
2. **Bovine Malignant Catarrh:** usually mature cattle - sporadic and small outbreak occur - erosive stomatitis and gastroenteritis - enlargement of lymph nodes - ocular lesions - hematuria - terminal encephalitis - high mortality.
- 3- **Bovine Virus Diarrhea/Mucosal Disease:** ages 6 months to 2 years calves which have been persistently infected since fetal life - low incidence (5%) of acute clinical signs but high mortality.
- 4- **Alimentary form of IBR in newborn calves:** morbidity rate is 25-50% - mortality rate is more than 90% - small pin point gray pustules on soft palate - rhinotracheitis - conjunctivitis - persistent mild fever.

**4. Infectious diseases causing oral lesions without diarrhea:**

- 1- **FMD:** high morbidity and low mortality rates - ropy salivation - vesicles in mouth, teats and interdigital spaces - tiger heart in calves.
- 2- **Vesicular stomatitis:** horses and cattle are infected - insect borne disease - mild fever - anorexia - vesicles in oral cavity, less commonly on teats and feets - high recovery rate.
- 3- **Bluetongue:** sheep and cattle are infected - rarely goats - high fever - erosive stomatitis - edema of lips - laminitis - hemorrhage at the base of pulmonary artery.
- 4- **Bovine Papular Stomatitis:** common in young cattle (2 weeks to 2 years) - no mortality - round, dark, raised papules on muzzle and in oral cavity.

**5. Infectious diseases causing diarrhea without oral lesions:**

**A- Bacterial diseases:**

- 1- **Enterotoxigenic E. coli:** Newborn calves less than 3-5 days of age - acute profuse watery diarrhea - dehydration - acidosis.
- 2- **Salmonellosis:** all ages - acute diarrhea - dysentery - fever.
- 3- **Clostridium perfringens types B and C:** young well nourished calves less than 10 days of age - severe hemorrhagic enterotoxemia - sudden death.
- 4- **Mycobacterium paratuberculosis (Johne's disease):** clinical signs occur after 2-5 years - diarrhea may be continuous or intermittent.
- 5- **Proteus spp. and Pseudomonas spp.:** chronic to subacute diarrhea - poor response to treatment - progressive loss of weight.

**B- Fungi:**

**Candida spp.:** in young calves following prolonged use of antibiotics - chronic diarrhea - no response to antibiotics.

**C- Viruses:**

- 1- **Rotavirus and Coronavirus:** in newborn calves, 5-21 days old - acute profuse watery diarrhea - no response to antibiotics.
- 2- **Winter dysentery (Coronavirus):** A highly contagious disease of cattle characterized by a brief attack of severe diarrhea and sometimes dysentery - explosive herd outbreak of diarrhea which, in the course of the next 4-7 days, affect the majority of adult cattle - youngs show mild clinical signs.

**D- Helminthes:**

- 1- **Ostertagiasis:** persistent diarrhea without smell, mucus or blood - dehydration - hypoproteinemia.

**2- Fascioliasis:** chronic diarrhea - loss of weight - milk production falls - anemia.

**3- Paramphistomiasis:** persistent fetid diarrhea - dehydration.

**E- Protozoa:**

**1- Eimeria spp.:** calves over 3 weeks old and cattle up to 12 months of age, dysentery, mild fever, appetite and hydration remain normal, about 20% develop nervous signs.

**2- Cryptosporidium spp.:** calves 5-35 days of age - persistent diarrhea with or without treatment with the usual treatments of diarrhea.

**6. Infectious diseases causing pneumonia in cattle**

**1- Pneumonic pasteurellosis (Shipping Fever):** occurs after 7-10 days of transport stress - acute toxemic bronchopneumonia - fever - increased breath sounds over ventral aspects of lungs.

**2- Viral interstitial pneumonia:** in yearling and adult cattle - sudden onset of acute pneumonia - moderate dyspnea and toxemia - bronchiolitis - no moist crackles.

**3- Enzootic pneumonia of calves:** common disease in housed dairy calves, occasionally in pastured beef calves 2-6 months of age - acute, subacute and chronic pneumonia - loud breath - moderate fever.

**4- Bovine Respiratory Syncytial Virus (BRSV) infection:** in young cattle 6-8 months of age - occasionally adults - inappetence - fever - coughing - dyspnea - abnormal lung sounds.

**5- Haemophilus somnus pneumonia and pleuritis:** common in feedlot calves 6-8 months of age - toxemic suppurative bronchopneumonia - toxemic pleuritis - persistent fever for several days.

**6- Infectious Bovine Rhinotracheitis (IBR):** common in feedlot calves - acute rhinotracheitis - discrete nasal lesions - ocular and nasal discharges - fever - dyspnea.

**7- Verminous pneumonia:** all ages susceptible, usually calves 6-12 months on pasture and wet warm seasons - moderate to severe dyspnea - loud breath.

**8- Calf diphtheria:** occur in young calves, dirty conditions or on dry pasture - acute toxemia - fever - dyspnea - necrotic lesions in larynx and oral cavity.

**9- Allergic rhinitis (summer sniffles):** mostly in late summer, autumn when pasture in flower - sporadic cases - sudden onset -dyspnea - stertor - mucopurulent then caseous yellow to orange nasal discharge - sneeze - rub muzzle in bushes - twigs up nose - bleed .

**10- Contagious Bovine Pleuropneumonia:** morbidity is high - mortality up to 50% - acute fibrinous pneumonia - pleurisy - dyspnea - fever - deep shallow cough - elbows out - pain on chest percussion - pleuritic friction nib early - moist crackles.

**11- Pulmonary abscess:** sporadic case - history of pneumonia with no response to treatment - chronic cough with epistaxis and hemoptysis - chronic toxemia - mild fever - crackles.

**7. Infectious diseases causing red urine (hemoglobinuria):**

**1- Babesiosis:** urine is dark red to brown in color - pale then icteric mucous membranes - splenomegaly - enlarged liver - the carcass is infested with ticks.

**2- Theileriosis:** fever - anemia - enlargement of superficial lymph nodes - ocular discharge - corneal opacity.

- 3- **Bacillary hemoglobinuria:** highly fatal toxemia - high fever - hemoglobinuria and jaundice - presence of necrotic infarcts in liver.
- 4- **Leptospirosis (L.pomona):** fever - icterus - hemoglobinuria - milk tinged with blood - flaccid udder without cardinal signs of inflammation - abortion.

**N.B. Non infectious diseases causing red urine:**

Post-parturient hemoglobinuria - copper poisoning - chlorate poisoning - cold water hemolytic anemia in calves - mycotoxicosis.

**8. Infectious diseases causing nervous manifestation:**

- 1- **Sporadic Bovine Encephalomyelitis and Transmissible Serositis (SBE-TS):** fever - eye and nose discharge - loss of appetite - lameness - stiffness - knuckling of the fetlocks - posterior paralysis - prostration - frothing at the mouth - lateral recumbency - some cases show blindness - circling - abdominal pain and death.
- 2- **IBR/IPV:** The encephalomyelitis form - head pressing - circling - incoordination - opisthotonus - bellowing - frothing at the mouth - convulsion.
- 3- **Bovine Malignant Catarrh:** nervous signs include incoordination - aggressive behavior - muscular tremors - convulsions - paralysis and finally death due to encephalitis.
- 4- **Cerebral babesiosis:** due to Babesia bovis only - convulsions - incoordination - mania - coma - drop in temperature - sometimes paralysis - congested grey and white matter of brain.
- 5- **Tetanus:** rigidity of muscles - stiffening of the neck - third eyelid protrudes over the eyeball when animal frightened - bloating - titanic spasm of the jaw muscles.

**6- Bovine spongiform encephalopathy:** sporadic fatal disease -long incubation period - changes in mental state - abnormalities of posture, movement and sensation.

**7- Rabies:** highly fatal viral disease - motor irritation - mania - encephalitis - ascending paralysis.

**9. Infectious disease causing paralysis:**

1- Sporadic Bovine Encephalomyelitis.

2- Ephemeral Fever (Three Day Sickness).

3- Septicemia following calving.

4- Blackleg disease.

5- Tick paralysis (*Ixodes holocyclus*).

6- Botulism.

7- Foot Rot.

8- Encephalitis and meningitis. 9- Acute Mastitis.

10- Abscess of the vertebral column.

11- Acute arthritis.

12- Babesiosis.

13- Winter Dysentery.

14- Tetanus.

15- Mycotoxicosis (Aflatoxicosis).

16-Sarcosporidiosis.

17- Polioencephalomalacia.

**N.B. Non- infectious diseases causing paralysis:**

Hypocalcemia - hypomagnesemia - ergot poisoning - algal poisoning - calving injuries - lead poisoning - transit tetany - prolapsed intervertebral discs - fractured pelvis - rupture of the round ligament of the hip joint - obturator paralysis - ketosis -ruminal impaction - rupture of uterus - rickets or mineral deficiencies - heat stroke - neurofibroma - azoturia -

organophosphate poisoning - loss of electrolytes - white muscle disease - downer cow syndrome.

## **II. Differential diagnosis of sheep and goat diseases**

### **A) Infectious diseases causing sudden death in young lambs:**

Vibriosis - listeriosis - brucellosis - toxoplasmosis - salmonella abortion - chlamydial abortion - enterotoxemia - colibacillosis in lambs - tetanus - acute coccidiosis - erysipelas septicemia - scabby mouth - navel ill - necrobacillosis - foot and mouth disease - contagious pustular dermatitis - malignant form of pox - leptospirosis - tick paralysis - Rift Valley fever - parainfluenza 3 - malignant edema.

### ***B) Non-infectious diseases causing sudden death in young lambs:***

Blowfly strike, phenothiazine poisoning, goiter, enzootic ataxia, copper deficiency, thiamine deficiency, lambing troubles, jaundice in newborn lambs, clover disease, cobalt deficiency, vitamin A deficiency, white muscle disease and abomasal bloat.

### **Infectious diseases causing lameness, stiffness, staggering or paralysis:**

Foot rot - foot abscess - strawberry foot rot (*Dermatophilus congolensis*) - navel ill - suppurative arthritis - strongyloides worms - acute mastitis - blackleg - listeriosis - tetanus - abscesses of spinal cord - colibacillosis in lambs - botulism - Corynebacterial encephalitis and meningitis - mycotic dermatitis (lumpy wool) - scrapie - tick paralysis - bluetongue disease - sarcocystosis - foot and mouth disease.

### **Non-infectious diseases causing lameness or paralysis:**

Enzootic ataxia - white muscle disease - bone fragility - rickets - hypocalcemia - hypomagnesemia - pregnancy toxemia - copper and cobalt deficiency - vitamin D and A deficiency.

### **Infectious diseases causing diarrhea in sheep:**

#### **A) Bacterial diseases:**

- 1- **E. coli (colibacillosis):** newborn lambs in crowded lambing sheds - acute diarrhea (yellow feces) - septicemia and rapid death.
- 2- **Lamb dysentery:** newborn lambs up to 10 days of age - sudden death - diarrhea - dysentery - toxemia.
- 3- **Clostridium perfringens type D (enterotoxemia):** adult lactating - does - peracute, acute and chronic forms - watery diarrhea with feces containing blood and mucus - weakness - abdominal colic.
- 4- **Salmonella spp.:** newborn lambs and adult sheep in the pregnancy - acute diarrhea and dysentery in lambs - acute toxemia and diarrhea in ewes followed by abortion.
- 5- **Mycobacterium paratuberculosis (Johne's disease):** mature ages - loss of weight - chronic diarrhea - long course no respond to therapy.

#### **B) Viruses:**

- 1- **Rota and Corona viruses:** newborn lambs - many lambs affected - acute profuse watery diarrhea - no toxemia - no respond to antibiotics.
- 2- **Peste Des Petitis Ruminants:** is more severe in goats than in sheep - kids over 4 months and under one year are more susceptible - mortality in goats is 55-85 % and in sheep less than 10%.



### **C) Parasites:**

- 1-Nematodirus spp.:** lambs 4-10 weeks of age on pasture - sudden onset  
- anorexia - diarrhea - 10-20% of lambs may die if not treated.
- 2- Ostertagia spp.:** lambs 10 weeks of age and older lambs and young ewes on grass - many lambs develop diarrhea - abomasitis - weight loss.
- 3- Trichostrongylus spp.:** 4-9 months of age - dull - anorexia - loss of weight - chronic diarrhea.

### **D) Protozoa:**

- 1- Eimeria spp.:** overcrowding - poor sanitation and hygiene -acute and subacute diarrhea - dysentery - loss of weight.
- 2- Cryptosporidium:** lambs 7-10 days of age - dullness – anorexia - diarrhea may die in 2-3 days.

### **4. Infectious diseases causing sudden death in adult sheep and goat:**

Anthrax - enterotoxemia - black disease - swelled head in rams - acute liver fluke disease - braxy - malignant edema - tetanus - pasteurellosis - acute leptospirosis - acute salmonellosis - bacillary hemoglobinuria - Rift Valley Fever - acute mastitis - massive Haemonchus contortus infestation - sheep and goat pox (malignant form).

### **Non-infectious diseases causing sudden death:**

Hypocalcemia - hypomagnesemia - plant poisoning - arsenic, nitrate, HCN and algae poisoning - chronic copper poisoning - acute bloat - snake bite - urea poisoning.

### **Infectious diseases causing abortion in sheep**

#### **I- Bacterial**

1- Brucellosis.

2- Leptospirosis

- 3- Listeriosis
- 4- Salmonellosis.
- 5- Colibacillosis.
- 6- Enzootic abortion of ewe.
- 7- Epizootic viral abortion (Borrelia-like spirochete).
- 8- Ovine genital campylobacteriosis.
- 9- *Bacillus* spp., *Streptococcus* spp., *Pasteurella multocida*,  
*Arcanobacterium pyogenes*.

## **II- Viral**

- 1- Rift valley fever.
- 2- Wessels-borne disease.
- 3- Akabane disease.
- 4- Blue tongue.
- 5- Border disease.
- 6- Mucosal disease.

## **III- Parasitic**

- 1- Toxoplasmosis.
- 2- Sarcocystosis.

## **IV- Fungal**

- 1- *Aspergillus absidia*.
- 2- *Mucor* spp.

## **V- Rickettsial**

- 1- Tick-borne fever.
- 2- Q-fever.

### **Infectious diseases causing nervous manifestations in sheep**

#### **I- Viral**

- 1- Akabane disease.
- 2- Border disease.
- 3- Rabies.
- 4- Pseudorabies.
- 5- Louping ill.
- 6- Scrapie.
- 7- Caprine arthritis encephalitis.

#### **II- Bacterial**

- 1-Tetanus.
- 2-Botulism.
- 3- Listeriosis.
- 4- Brain abscess (*Staph. aureus*).
- 5- Focal symmetrical encephalomalacia (*Cl. perfringens* type D).
- 6- Polioencephalomalacia (Bacterial thiaminases).

### **III- Parasitic**

- Coenurosis.

### **IV- Fungal**

- Tremorgen staggers

## **Infectious diseases causing skin lesions in sheep**

### **A- Non-pruritic skin diseases:**

#### **I- Bacterial**

- 1- Dermatophilosis (Lumpy wool disease).
- 2-Caseous lymphadenitis.
- 3-Infectious bulbar necrosis.
- 4-Actinobacillosis.
- 5-Foot rot.

#### **II- Viral**

- 1- Contagious ecthyma.
- 2- FMD.
- 3- Sheep and goat pox.
- 4- Blue tongue.
- 5- Border disease.
- 6- Ulcerative dermatosis.

### **III- Parasitic**

1- Chorioptic mange.

2- Demodicosis.

**B- Pruritic skin diseases:**

**I- Parasitic**

1- Psoroptic mange.

2- Sarcoptic mange

3- Tick infestation.

4- Head fly infestation

5- Myiasis.

6- Louse infestation.

**II- Fungal**

- Ringworm

**III- Bacterial**

- Staphylococcus dermatitis.

**IV- Viral**

- Scrapie

**III. Differential Diagnosis of Equine Diseases**

**1. Infectious diseases causing abortion in mares:**

Equine viral arteritis - equine viral rhinopneumonitis - leptospirosis - brucellosis - Salmonella abortus equi infection - fungal infection.

**2. Infectious diseases causing anemia:**

Equine infectious anemia - equine babesiosis - worm infestation - leptospirosis - tick and blood sucking insects.

**3. Infectious diseases of horse causing diarrhea in foals and horses:**

**1- Salmonella spp.:** young foals - mature horses following stress - acute profuse foul smelling diarrhea - dehydration.

**2- Corynebacterium equi:** young foals - diarrhea associated with Cor. Equi pneumonia.

- 3- Actinobacillus equi:** newborn foals - sudden onset of depression - diarrhea and death in 24 hours.
- 4- Clostridiosis:** any age - acute profuse watery foul smelling diarrhea - death in 24 hours.
- 5- Rotavirus, Coronavirus and Adenovirus:** newborn foals -profuse watery diarrhea at few days of age.
- 6- Rickettsia ( Ehrlichia risticii ):** in summer and fall seasons - any age - depression - anorexia - fever - profuse watery diarrhea -mortality rate is 30% .
- 7- Fungi (Aspergillus fumigatus):** in foals and race horses treated orally with antibiotics - chronic diarrhea.
- 8- Strongylus spp., Trichonema spp. and Ascaris spp.:** individual horses usually over 6 months of age - acute, subacute or chronic diarrhea - hypoproteinemia.

**Physical:**

Sand colic - stress induced - dioctyl poisoning.

**Tumor:** lymphosarcoma.

**Miscellaneous or unknown etiology:** colitis x - granulomatous enteritis - tetracycline induced - phenylbutazone toxicity - foal-heat diarrhea.

**4. Infectious diseases causing sudden death in foals and horses:**

Anthrax - verminous arteritis - malignant edema - equine babesiosis - shigellosis in foals - leptospirosis in foals.

**Infectious diseases causing skin lesions of the lower limbs in horse:**

**I- Bacterial**

- 1- Glanders (Equine farcy).

- 2- Ulcerative lymphangitis.
- 3- Contagious acne (Canadian horse pox).

## **II- Fungal**

- 1- Epizootic lymphangitis.
- 2- Sporotrichosis.

## **III- Parasitic**

- 1- Leg mange (Chori optic mange).
- 2- Swamp cancer (Larvea of Habronema megastoma).

## **IV- Viral**

- Horsepox (leg form, very rare).

## **Infectious diseases causing respiratory manifestations in horse**

### **I- Bacterial**

- 1- Strangles.
- 2- Glanders (nasal form).
- 3- P. multocida and P. caballi.
- 4- Brodetella bronchiseptica.
- 5- Actinobacillus equuli.
- 6- Miliary TB.

### **II- Viral**

- 1- A.H.S. (pulmonary form)
- 2- Equine influenza.
- 3- Equine viral arteritis.
- 4- Equine viral rhiriopeumonitis.
- 5- Equine rhinovirus.
- 6- Equine adenovirus.

### **III- Parasitic**

- Verminous pneumonia.

## **Infectious diseases causing nervous manifestations in horse**

### **I- Bacterial**

- 1- Tetanus.
- 2- Botulism (type C, A).

3- Vertebral osteomyelitis (Salmonella spp.).

4- Spinal cord abscesses (Staph. and Strep. spp).

## **II- Viral**

1- Equine encephalomyelitis.

2- Rabies.

3- Herpes virus paralysis.

## **III- Parasitic**

- Cerebrospinal nematodiasis (Verminous encephalitis).

## **IV- Fungal**

- Guttural pouch disease.

# **IV. Differential diagnosis of dog diseases**

**1- Diseases causing abortion in bitch:** toxoplasmosis -brucellosis - herpes virus infection - genital streptococcal infection- canine distemper.

**2- Diseases causing red urine:** leptospirosis - canine babesiosis.

**3- Diseases causing cough:** canine distemper - canine infectious hepatitis - canine infectious rhinotracheitis - canine herpesvirus - toxoplasmosis - tuberculosis - fusospirochetal disease - *Olserus olseri* infestation - *Paragoniumus kelli coti* infestation - *Capillaria aerophila* infestation - *Aelurostrongylus* infestation.

**4- Diseases causing nervous signs:** distemper - rabies - toxoplasmosis - tetanus - ear mange - canine babesiosis - leptospirosis - worm infestation as whip worm infestation.

**5- Diseases causing jaundice:**

**Infectious diseases:** leptospirosis - canine infectious hepatitis - toxoplasmosis - canine babesiosis - histoplasmosis.

**Non-infectious diseases:** phosphorus, chloroform, arsenic and lead poisoning - snake bite - liver neoplasm - aflatoxicosis.

**6- Diseases causing diarrhea:** canine distemper - canine infectious hepatitis - parvovirus infection - toxoplasmosis - coccidiosis -

tuberculosis - histoplasmosis - worm and protozoal infestation - salmonellosis.

**7- Diseases causing sudden death in dogs:**

**Infectious diseases:** acute infectious canine hepatitis- leptospirosis- clostridial diseases - tick paralysis - acute coccidiosis - anthrax - parvovirus infection.

**8- Non infectious diseases:** lead poisoning- snake bite- acute vitamins A and E deficiency- myocarditis- nitrate poisoning.

**Diseases causing skin irritation or skin lesions:** mange-ectoparasites such as lice, ticks and hookworm infestation - strongyloides.



**Postmortem examinations and tacking the samples:**

<b>Disease and cause</b>	<b>Postmortem examination</b>	<b>Samples and lab test</b>
Botulism ( <i>Cl. botulinum</i> type A,B,C,D,E)	- There is no specific lesion.	- Toxin in the liver is diagnostic. - Filtrate of intestine is fed to lab animals. - Serum antitoxin assay. - Culture of suspect feed.
Lamb dysentery ( <i>Cl. perfringins</i> type B)	- The carcasses showed rapid signs of diarrhea and dehydration. - Hemorrhagic enteritis with ulceration of the mucosa, the intestinal mucosa is congested and dark red and the ulcers are large 2.5 cm in diameter and surrounded by zone of hemorrhage.	- Faecal smear to detect the microbe. - Culture of intestinal content and detection of the toxin. - Detection of the antitoxin by ELISA. - Filtrate from intestinal segment and injected to lab animals.
Pulpy kidney ( <i>Cl. perfringins</i> type D)	- Straw colored gelatinuos fluid in the pericardial sac. - Pulmonary edema. - Soft pulpy kidney. -Symmetrical, focal degenerative brain lesion.	-As lamb dysentery. + there is hyperglycemia and glucosuria.

Struck ( <i>Cl. perfringens</i> type C)	- Peritonitis. - Muscles may resemble malignant edema.	- As lamb dysentery.
Braxy ( <i>Cl. septicum</i> )	- Congestion, ulceration and edema of abomasums.	- Smear from the lesion or samples from the heart blood for detection the microbes.
Black leg ( <i>Cl. chauvoei</i> )	- Excessive fibrinous blood stained fluid in all body cavity. - Dark swollen tissue on incision exudes excessive thin serosanguinous fluid contains gas with rancid odour.	- Bacteriological examination of needle aspiration
Malignant edema ( <i>Cl. septicum</i> )	- Skin gangrene at the site. - Inflammatory, gelatinous fluid subcutaneous. - Subserious haemorrhages. - Serosanguinous fluid in the body cavity.	- Bacteriological examination of the lesion.
<b>Black disease</b> ( <i>Cl. novyi</i> type B)	- Blood stained serious fluid in all body cavity. Many subepicardial and subendocardial petechiae.	- The microbes in the necrotic lesion identified by cultures or florescent antibody technique or toxin by ELISA on intestinal

	<ul style="list-style-type: none"> <li>- 1-2 cm diameter areas of yellow necrosis surrounded by red hyperemic zone under the liver capsule or deep in liver.</li> <li>- Evidence of immature liver fluke invasion.</li> </ul>	content.
<p><b>Big head</b> (<i>Cl. novyi</i> type A)</p>	<ul style="list-style-type: none"> <li>- Doughy swelling under the eye lids and lower part of the head and the neck.</li> <li>- Yellowish exudates in the swollen area.</li> <li>- Enlargement of head lymph nodes.</li> </ul>	- Bacteriological examination of the lesion.
<p><b>Bacillary haemoglobinuria</b> (<i>Cl. novyi</i> type D)</p>	<ul style="list-style-type: none"> <li>-Sub cutaneous gelatinious edema.</li> <li>-Sub cutaneous haemorrhages and subserous haemorrhages.</li> <li>- jaundice.</li> <li>-Blood stained fluid in the body cavity.</li> <li>-Red urine.</li> <li>-Haemorrhagic enteritis and abomasitis.</li> <li>-Ischemic infarction in the liver.</li> <li>-Evidence of immature liver fluke invasion.</li> </ul>	-Diagnosis of the microbes in the hyperemic zone around the infarct area by fluorescent antibody technique on impression smears.

<p><b>Septicemic listeriosis</b> (<i>L. monocytogenes</i>)</p>	<p>Necrotic foci in liver, spleen and myocardium</p>	<p>-Histological appearance of the lesion. -Bacteriological examination of the lesion. -Florescent antibody technique on the lesion.</p>
<p><b>Septicemic Leptospirosis</b> (<i>L. pomona</i>)</p>	<p>-Anaemia, jaundice and haemoglobin urea. -Ulcer and haemorrhages in the abomasal mucosa. -Pulmonary edema and emphysema. -Interstitial nephritis diffuse or local.</p>	<p>- Isolation and identification of microbes from the blood during fever. - Animal inoculation of the blood culture. -Leukocytosis. -Haemoglobinurea. -Haemolytic anemia.</p>
<p><b>Anthrax</b> (<i>Bacillus anthracis</i>)</p>	<p>-Saw horse attitude. -Tarry blood from all body orifices. -Large black pulpy spleen.</p>	<p>-Blood film. -Isolation of the microbes from the edema fluid. -Animal inoculation. -Serological test. -Ascoli's test.</p>
<p><b>Septicemic salmonellosis and colibacillosis</b></p>	<p>-Petechial haemorrhages in all mucous membrane and subcutaneous. -Blood stained fluid in all body cavity</p>	<p>1-In salmonellosis: bacteriological isolation and histopathology from iliocecal lymph nodes, ilium, colon, spleen, lung, liver and</p>

		gall bladder mucous membrane. 2- In colibacillosis: Bacteriological isolation from the m.m of the small intestine.
<b>Septicemic pasteurelosis (<i>P. multocida</i>)</b>	-Subcutaneous infiltration of gelatinous fluid. -Petechial haemorrhages in the m.m and subcutaneous. -Pulmonary edema and pneumonia. -Haemorrhagic enteritis.	- Bacteriological isolation, serological study and animal inoculation of the heart blood. - Bacteriological isolation from nasal swab, bone marrow and spleen. - Histopathology of the lung and its lymph nodes.
<b>Rift valley fever (<i>Phlebo virus</i>)</b>	-Liver swollen, friable and mottled. -Parenchyma of the liver contains multiple gray yellow foci surrounded by red zone of congestion. -Hemorrhages in subendocardium and subepicardium. -Splénomegally. -Lymphadenopathy.	1-The samples: Serum, liver of fetus, liver of dam. 2-The tests and - CFT-HA-HI ELISA.. - Virus isolation-unweaned mice inoculation.

<p><b>Acute fascioliasis</b> (<i>F. gigantica</i>)</p>	<ul style="list-style-type: none"> <li>-Liver is enlarged and haemorrhagic.</li> <li>-Haemorrhagic tracts and invasion in the liver parenchyma.</li> <li>-Blood stained serum in the abdominal cavity.</li> <li>-Oozing blood from the natural orifices.</li> </ul>	<p>Isolation and histopathology from the liver.</p>
<p><b>Acute haemonchosis</b></p>	<ul style="list-style-type: none"> <li>-Pallor tissues.</li> <li>-Thin blood.</li> <li>-Large numbers of worms in the abomasums.</li> <li>-Abomasal wall is hyperemic with haemorrhages of dark red due to acid hematin.</li> <li>- Small ulcers at attachment points for the worms.</li> </ul>	<p>- Isolation of the immature and adult worms and histopathology from the abomasums.</p>

## **Infectious diseases problems and signs of ill-health in camels**

There are many signs indicate the ill health but the animals may be normal, so we discuss the problems and sign of ill health in camels as the following:

### **Increase of the body temperature in camel:**

#### **I. Physiological normal:**

- The ability of camel to vary its temperature is a reflexion of the environmental in which it has evolved.
- Fluctuation of the body temperature can exceed 6°C in 24 hours period.
- Fluctuation of the body temperature is important for camel reared under hot, aired desert condition where the ambient temperature may reach 50°C or more in the summer.
- Normal temperature of the camel under the desert condition:
  - 1- Lower temperature 36-36.5°C occurs in the early morning.
  - 2- 39°C occurs during the day light and the evening.

#### **II. Viral:**

- 1- Rift valley fever.
- 2- Camel pox.
- 3- Orf or CPD.

#### **III. Bacterial**

- 1- Anthrax.
- 2- Haemorrhagic disease.
- 3- Salmonellosis.
- 4- Haemorrhagic septicaemia.
- 5- Camel plague.
- 6- Black quarter.

#### **IV. Protozoal and parasitic**

- 1- Trypanosomiasis.
- 2- Dipetalonemiasis.

3- Lung worm

#### **V. Non infectious disease**

- Dry coat.

### **Oedema in camel**

Is a swelling caused by the accumulation of fluid in the body tissue. In the camel, under the belly, in the lower limb and on the udder. It is caused by:

#### **I. Physiological normal**

- 1- In pregnancy and after parturition, it occurs usually on the udder.
- 2- After traveling for long distance, it occurs usually on the four legs and is called gravitates edema.
- 3- After the camel trunk a lot of the water, it occurs usually on the belly.

#### **II. Protozoal and parasitic**

- 1-Trypanosomiasis (under the belly).
- 2- Filariasis (on the legs, scrotum, prepuce and some what on the belly).
- 3- Heavy parasitism (under the belly).

#### **III. Viral**

- 1- Pox (in the face and under the lower jaw).
- 2- CPD (in the face and under the lower jaw).

#### **IV. Bacterial**

- 1- Haemorrhagic septicaemia (lower jaw and throat).

#### **V. Non infectious diseases**

- 1- Heart failure (under the belly).



- 2- Pneumonia (under the belly).
- 3-Around the wound.
- 4- Around the insect bite.
- 5- Around the scorpion bite.
- 6- Snake bite (on the legs).
- 7-Arsenic poisoning (on the legs).
- 8- Hospitalized camel (on the legs).

### **Emaciation (weight loss) in camel**

It is a condition that may occur normally or due to the disease and it occurs with different degree, it is caused by:

#### **I. Bacterial (diseases causing diarrhea):**

- 1-Salmonellosis.
- 2- Colibacellosis.
- 3- Haemorrhagic septicaemia.
- 4- Paratuberculosis.
- 5- Caseous lymphadenitis.
- 6- Tuberculosis.

#### **II. Parasitic**

- 1 - Highly infestation of tick.
- 2- Heavy parasitism.
- 3- Trypanosomiasis.

#### **III. Non infectious diseases:**

##### **1- Injured dulaa:**

- Affect only the male in the rut or the rutting season.
- Excited male camels balloons out its soil palate (called dulaa in Arabic) during the breeding seasons.

### **Skin lesions and hair or wool changes**

#### **I. Normally:**

All camels moult in spring and have grown a new coat by autumn.

## **II. Parasitic:**

- 1- Mange.
- 2- Tick, lice and fleas.
- 3- Onchocercosis.

## **III. Fungal:**

- Ring worm.

## **IV. Bacterial:**

- 1- Contagious skin necrosis.
- 2- Dermatophillosis.
- 3- Skin abscess.
- 4- Chest pad abscess.
- 5- Caseous lymphadenitis.

## **V. Viral:**

- 1- Camel pox.
- 2- Orf or CPD.

## **VI. Non infectious diseases:**

- 1- Bites and stings.
- 2- Wound and burns.
- 3- Saddle sores.
- 4- Dermoids.

## **Diseases causing diarrhoea in camel**

### **1-Infectious causes:**

- 1- Salmonellosis.
- 2- Trypanosomiasis.
- 3- Haemorrhagic septicaemia.
- 4- Paratuberculosis.
- 5- Trypanosomiasis.
- 6- Cestodes.
- 7- Gastro intestinal nematodes.
- 8- Colibacellosis.
- 9- Haemorrhagic enteritis (clostridial disease).

### **2. Non infectious diseases:**

- 1- Sudden change of the food.
- 2- Large amount of the milk.
- 3- Plant poisoning.

4- Stress as transport by lorry, examination and treatment.

## **Enlargement to the regional lymph nodes in camel**

### **I. Bacterial:**

- |                              |                  |
|------------------------------|------------------|
| 1- Caseous lymphadenitis.    | 2- Camel plague. |
| 3- Contagious skin necrosis. | 4- Tuberculosis. |
| 5- Haemorrhagic disease.     |                  |

### **II. Viral:**

- |                |                     |
|----------------|---------------------|
| 1 - Camel pox. | 2- Viral papilloma. |
| 3- CPD.        |                     |

### **III- Parasitic and protozoal:**

- |                     |                      |
|---------------------|----------------------|
| 1- Trypanosomiasis. | 2- Dipetalonemiasis. |
|---------------------|----------------------|

## **Respiratory distress in the camel**

### **I. Parasitic disease:**

- 1- Lung worm.
- 2- Nasal bots (cephalopina titllator)
- 3- Leeches (camels take leeches when drink infested water. The leeches attach on the back of the mouth and gums, and may disturb breathing.
- 4- Dipetalonemiasis.

### **II. Bacterial:**

- |                              |                  |
|------------------------------|------------------|
| 1- Haemorrhagic septicaemia. | 2- Tuberculosis. |
| 3- Camel plague.             |                  |

### **III. Non infectious:**

- |                         |                 |
|-------------------------|-----------------|
| 1- Drenching pneumonia. | 2- Common cold. |
|-------------------------|-----------------|

## **Nervous signs in camel**

Camel with nervous characterized by aggressive, convulsion, tremor, nystagmus, attack animals and human, paralysis and paresis, spasm, runaway, bellows long time and loud and staggering restlessness.

### **Causes:**

- |                            |                         |
|----------------------------|-------------------------|
| 1- Male in rutting season. | 2- Tetanus.             |
| 3- Rabies.                 | 4- Tick paralysis.      |
| 5- Bites and stings.       | 6- Snake bite.          |
| 7- Otitis media.           | 8- Thiamine deficiency. |
| 9- Sun stroke.             | 10- Plant poisoning.    |

## **Stiff gait and lameness in camel**

### **Causes:**

- |                          |                       |
|--------------------------|-----------------------|
| 1- Broken bones.         | 2- Arthritis.         |
| 3- Dislocated knee cap.  | 4- Myopathy.          |
| 5- Affection to foot.    | 6- Ulcer on the sole. |
| 7- Cracked or worn pads. | 8- Foot wounds.       |

## **Pica signs in camel**

### **Causes:**

- |   |                        |
|---|------------------------|
| 1- Lack of salt.  | 2- Vitamin deficiency. |
| 3- Internal parasite.   | 4- Rabies.             |
| 5- Boredom.   |                        |
| 6- Lack of certain minerals in the food such as phosphorus, calcium and iron. |                        |

**Vaccination program suggested for cattle and buffaloes in Egypt**

<b>Name of disease</b>	<b>Type of the vaccine</b>	<b>Age of vaccination</b>	<b>Booster dose</b>
E. coli K99, Rota and corona. Ex.: Rotvec vaccine	Killed compound adjuvant vaccine.	Vaccination of pregnant dam 2 times 3 weeks apart, the second one is at 3-4 weeks before parturition.	-
IBR, BRSV, PI3 and BVD/MS Ex.: Cattle master 4	Inactivated compound vaccine.	- Vaccination of calves at 4-6 months of age. - The number of antigens present are according to infection problems	Every 6-12 months.
Foot and Mouth Disease (FMD)	Aziridine inactivated vaccinated bivalent O and A tissue culture vaccine	-If the dam is vaccinated: its calf is vaccinated at 6 months of age. -If the dam is not vaccinated: its calf is vaccinated at 4 months of age.	Every 6 months
Lumpy skin disease	Living attenuated sheep pox vaccine	Vaccination of calves at 4-6 months of age intradermally	Every one year
Rift vally fever	Inactivated tissue culture vaccine	Vaccination of calves at 4-6 months of age and as in case of FMD	Every 6 months
Hemorrhagic septicemia Ex.: Pneumo-Bac	Killed adjuvanted contains P. multocida and P. hemolytica	Vaccination of calves at 4-6 months of age and 3-4 weeks before expected time of infection especially summer season or stress.	Every 6-12 months
Blackleg and Bacillary hemoglobinuria	Killed adjuvanted bivalent vaccine	Vaccination of calves before 4-6 months of age.	Every 6 months

**Vaccination program suggested for sheep and goats in Egypt**

<b>Name of disease</b>	<b>Type of the vaccine</b>	<b>Age of vaccination</b>	<b>Booster dose</b>
Clostridial disease (Covexin 8 or 10) Ultrabac 8	Alum precipitated killed polyvalent vaccine	Vaccination of pregnant dam 2 times 3 weeks apart, the second one is at 3-4 weeks before parturition.	-
Rift vally fever	Inactivated tissue culture vaccine	Vaccination of lambs at 4-6 months of age especially before insect season	Every 6 months
Bluetongue	Inactivated polyvalent vaccine	Vaccination of lambs especially Merino spp. Not kids at 4-6 months of age.	Every 6 months
Sheep pox	Living attenuated	Vaccination of sheep and goats intradermally at 4-6 months of age	Every one year
Pasteurellosis (Pneumo-Bac)	Killed adjuvant contain P. hemolytica and P. multocida	Vaccination of lambs at 4-6 months of age.	Every 6-12 months

## Equine vaccines

### 1- African horse sickness vaccines

Indication	Protection of horse, mule and donkey against AHS	Protection of horse, mule and donkey against AHS
<b>Type</b>	Live attenuated polyvalent freeze dried vaccine.	Bivalent (type 4 and 9) inactivated tissue culture vaccine.
<b>Age of animal</b>	In all ages (Pregnant animal vaccinated before or after parturition by one month).	-Pregnant mares can be vaccinated up to 6 months. -Fools born from immune mares are vaccinated at age of 6 months. -Fools born from non-immune mare are vaccinated at age of 3- 4 months.
<b>Dose</b>	2ml.	5 ml
<b>Route</b>	S/C	S/C or I/M
<b>Duration of immunity</b>	One year	6 months
	<ul style="list-style-type: none"> <li>• العبوة تحتوى على 20 جرعة (ولذلك يذاب المحتوى فى 40 مللى من المحلول الفسيولوجى المعقم).</li> <li>• يستعمل خلال نصف ساعة من إذابته.</li> <li>• مدة رد فعل التحصين 21 يوم.</li> </ul>	Package: Plastic bottles containing 300ml. (60 doses).

## 2- Hemorrhagic septicemia (HS) vaccines

	Oil adjuvanted vaccine	Formalized vaccine
<b>Indication</b>	Protection of cattle, Buff-aloos, sheep and goat against HS.	Protection of horse, donkey and mule against HS.
<b>Type</b>	Killed oil adjuvant vaccine of <i>P. multocida</i> type B.	Killed formalized vaccine <i>P. multocida</i> type B.
<b>Age</b>	From one month.	From one month.
<b>Dose</b>	2 ml in cattle 1 ml in sheep	-According to age: 6 month → 1 ml 6-12 month → 2 ml 1 -2 year → 3 ml 3 year and above →5 ml
<b>Route</b>	I/M	S/C
<b>Duration of immunity</b>	One year when disease occur seasonally in an area, animals shoule be vaccinated 2-3 weeks before the season when presence of outbreak all contact animals should be vaccinated at once.	6 month.
	<ul style="list-style-type: none"> <li>• زجاجة تحتوى على 300 مللى (تكفى 150 جرعة فى الأبقار و300 جرعة فى الأغنام).</li> <li>• رد فعل التحصين خلال أسبوع من التحصين.</li> </ul>	<ul style="list-style-type: none"> <li>• زجاجة تحتوى 300 مللى (عدد الجرعات بها حسب السن).</li> <li>• لا تحصن العشار فى الشهر الأخير.</li> <li>• رد فعل التحصين خلال أسبوع من التحصين.</li> </ul>



### Equine influenza

<b>Indication</b>	Protects equine against Equine Influenza
<b>Type</b>	Monovalent equine against Equine Influenza.
<b>Dose</b>	3 ml.
<b>Route</b>	I/M.
<b>Duration of immunity</b>	4-6 months.

### Camel vaccines

#### Camel pox vaccine

<b>Indication</b>	Protects camel against pox disease
<b>Type</b>	Live attenuated freeze dried tissue culture vaccine.
<b>Dose</b>	2 ml.
<b>Route</b>	I/M or S/C.
<b>Duration of immunity</b>	6 months.

### Pet-animals vaccines

#### 1- Rabies vaccines

<b>Indication</b>	<b>Prevention and treatment of rabies in dogs</b>	<b>Prevention and treatment of rabies in dogs, cats and farm animals</b>
<b>Type</b>	Live attenuated egg adapted freeze-dried vaccine {Flury (LEP) strain}.	Inactivated tissue culture vaccine (ERA Rabies virus strain).
<b>Age</b>	Not less than 6 months (street dog)	Not less than 2 months.
<b>Dose</b>	3 ml	2 ml in dogs and cats. 2 ml in sheep and goats. 4 ml in horses and donkeys. 5 ml in cattle and buffaloes.

<b>Route</b>	I/M (thigh)	S/C or I/M
<b>Duration of immunity</b>	One year (vaccinated annually).	One year (vaccinated annually).
	<ul style="list-style-type: none"> <li>• العبوة عبارة عن جرعة واحدة (تذاب في 3 مللى محلول فسيولوجى معقم).</li> <li>• عند إذابة التحصين فى المحلول المعقم يجب إعطائه على الفور.</li> <li>• لا تستخدم أى مطهر للإبرة المستخدمة فى الحقن حتى لا تقتل الفيروس.</li> </ul>	<b>Package:</b> <ul style="list-style-type: none"> <li>- Vials of 2 ml.</li> <li>- Vials of 10 ml.</li> <li>- Vials of 20 ml.</li> </ul>

## 2- Canine distemper vaccine

<b>Indication</b>	Protection of dogs against canine distemper disease
<b>Type</b>	Live attenuated freeze dried tissue culture vaccine
<b>Dose</b>	1 ml.
<b>Route</b>	S/C
<b>Duration of immunity</b>	One year.

## Canine parvo vaccine

<b>Indication</b>	Protection of dogs against canine parvo disease
<b>Type</b>	Live attenuated freeze dried tissue culture vaccine
<b>Dose</b>	1 ml.
<b>Route</b>	S/C
<b>Duration of immunity</b>	One year.

## **Main causes of vaccine failure:**

- 1- Vaccine is not effective.
- 2- Vaccine is expired.
- 3- Presence of stress factor (hot, cold, disease).
- 4- Malnutrition.
- 5- Improper dose of vaccine.
- 6- Improper route of the vaccine.

## **Trade name of some vaccine used for protection of pneumonia and enteritis:**

### **a) Viral vaccine:**

- |                     |                   |
|---------------------|-------------------|
| 1- Pneumo 3.        | 2- Pneumo 4.      |
| 3- Cattle master 4. | 4- Vira shield 5. |
| 5- Nasal gene.      |                   |

### **b) Bacterial vaccines:**

- |                 |                      |
|-----------------|----------------------|
| 1- Pneumo-bac.  | 2- Covexin 8 and 10. |
| 3- Ultrabac @8. |                      |

### **c) Mixed (viral and bacterial):**

- |                      |                   |
|----------------------|-------------------|
| 1- Entero-3-vaccine. | 2- Scour Guard 3. |
| 3- Rotvec vaccine.   |                   |

### **d) Hyperimmune serum**

- coli immune (E. coli + Rota and Corona virus).

## Laboratory diagnosis

### 1- Sample collection

Type of sample	Collected sample	Packaging	Preservation
<b>A. Parasitic infestation</b>			
1- Faeces	- 10g faeces from rectum - 50g for lungworm larvae	- in a wide-mouthed, screw-capped container - or sterile plastic bags.	- Examined immediately or - In refrigerator at 4°C - Or in 10% formalin (not in lungworm)
2- Blood	- One drop from ear vein - 2 ml whole blood from jugular vein	- On a clean slide - In a sterile lube	- fixed in methanol after spreading. - In anticoagulants
3- Skin scrapings	- Plucked hair or wool samples are useful for surface-feeding mites, lice and fungal infections - Deep skin scrapings, using the edge of a scalpel blade, are useful for burrowing mites.	- in screw-top containers and not envelopes. - or in Petri dish	- In 10% Pot. Or Sod. Hydroxide - Or in glycerin
<b>B. Bacterial infection:</b>			
	- <b>Swabs</b> from eyes (tears), nostrils (nasal discharge), mouth (saliva) and genital tract. - <b>Aspirated fluid</b>  - <b>Milk samples</b> (see mastitis)	- in suitable transport medium  - in an EDTA container	- At 4°C   - Can be frozen
<b>C. Viral infection:</b>			
	- <b>Trachio/bronchial washings or swabs</b> for respiratory viruses - <b>Faeces</b> , rather than swabs for enteric viruses. - <b>Deep scrapings and aspirated fluid</b> for viral skin diseases	- In virus transport medium (VTM)  - Without VTM  - With VTM in screw-topped containers	- At 4°C

#### D. Serology:

- For serum samples, the blood should be left to stand at ambient temperature for 1-2 hours until the clot begins to contract.
- The clot can then be rinsed round with a sterile rod and the bottles placed in a refrigerator at 4°C.
- After several hours, or overnight, the sample can be centrifuged at about 1000 g for 10-15 minutes and the serum can be decanted or removed with a pipette.
- In order to establish the significance of antibody titres, paired serum samples will often need to be collected 7-14 days apart.
- The sera can be stored at -20°C until use.

#### **E. Histopathology:**

- Tissue samples should not be more than 1cm thick and fully representative of the basic organ structure and include the junction between gross lesions & normal tissue.
- Samples should be immersed in 10-20 x their volume of fixative as soon as possible in a container with a wide opening.
- Brain is best fixed whole allowing the pathologist to select appropriate sites.
- Collect intestinal samples, as soon after death as possible (minutes not hours), from several sites of small and large intestine. Immersion fixation of gut tubes 1-2 cm in length is satisfactory, but avoid crushing with forceps.
- Material must be properly packaged and in urgent cases can be sent immediately. If nonurgent, tissue can be initially fixed for 48 hours then sent in a reduced volume of fixative.
- The recommended fixative for most cases is 10% formol saline.

#### **F. Haematology:**

- Fresh EDTA blood and fixed "animal-side" smear for routine haematology sent to the laboratory within 24 hours.
- Ensure tubes are filled but not overfilled. Mix well but do not shake.
- For clotting times and fibrinogen use fresh citrated blood.

**G. Biochemistry:**

- All biochemical tests in the Disease Surveillance can be performed on serum from clotted blood with the exception of:
- Copper and lead require a heparinised sample.
- Glucose and inorganic phosphate require sodium fluoride sample.
- Zinc assays require the use of all plastic collection vessels.

## **2- Faecal examination**

**Definition:**

It is one of the important laboratory aids that used for diagnosis of parasitic infestation, bacterial and viral infections.

**Indications:**

- 1. For diagnosis of parasitic disease as:** Trematodes as (*Fascioliasis* - *Paramphistomiasis*), nematodes, cestodes and protozoa (coccidiosis, ctyptosporidiosis).
- 2. Diagnosis of bacterial and viral diseases by isolation or detection of as antigen in faeces as** Colibacillosis, Clostridial enterotoxemia, Salmonellosis, Johne's and T.B.

**Methods of faecal examination:**

**I. Macroscopic examination (Gross examination):**

**A. Consistency of faeces:**

It depends on: Species of animals, type of food and disease.

**a) Normal consistency:**

**1) Horse:**

- i. *Stool feeding*: Large balls of regular shape, faeces are yellowish to brown.
- ii. *In grazing*: Softer in consistency & break on sticking the ground, dark green.

**2) Cattle:**

- i. *Housed fed cattle*: Firm and dark brown.
- ii. *Grass fed cattle*: Semisolid and form flat cakes and dark green.

**3) Sheep and goat:**

- Large number of firm somewhat spherical pellets.

**b) Abnormal consistency:**

1- Diarrhoea: as in case of

- i. Bacterial, viral and parasitic diseases.
- ii. Toxaemia.
- iii. Nutritional deficiency.
- iv. Liver disease.
- v. Pancreatic disease.

2- Constipation: as in case of

- i. Fever.
- ii. Parasitic disease.
- iii. Ketosis due to excessive mucus.

3- Pasty faeces: in case of:

- i. Impaction of rumen or caecum.
- ii. Abomasal displacement.

4- Creatorrhea: means undigested meat in faeces.

5- Steatorrhea: means large amount of fat in the faeces.

6- Incomplete digested cereal grains or hay: in faulty mastication.

**B) Odour:**

**a- Normal odour:** 1. Carnivorous: offensive.

2. Herbivorous: slightly unpleasant.

3. Horse: slightly unpleasant.

**b- Abnormal odour:** Offensive.

**C) Colour:**

**a- Normal colour:** depend on animal species and type of food.

**1. Cattle, sheep and goat:**

i. Green fodder: green.

ii. Beet root: dark red.

iii. Hay and grain: dark brown.

**2- Carnivorous:** Meat fodder: dark brown.

**b- Abnormal colour:**

1- Blackish brown: in constipation and toxæmia.

2- Pale or clay like: in case of impairment of bile.

**D) Blood in faeces:**

**Origin:**

1- Upper part of GIT and abomasum: are uniform dark or tarry because Hb has been reduced and evenly mixed by the process of digestion.

2- Large intestine: blood retains its normal colour and stain faeces red.

3- Terminal portion of colon or rectum: blood is not mixed uniformly through the faeces but is irregularly distributed on the surface in clots or in liquid form.

**Causes:**

1- Deep ulceration.

2- Foreign bodies.

3- Parasitic: as Haemonchus sp., Coccidiosis, Strongylosis and Theilariosis.

4- Bacterial: as Anthrax, Salmonellosis.



5- Viral disease: BVD-RP.

6- Vascular engorgement caused by torsion and intussusceptions

7- Embolic and thrombotic process as in parasitic mesenteric arteries.

**Occult blood:**

**Definition:** It is a blood in small amount that can not be recognized microscopically.

**Diagnosis:** by microscopic examination: intact RBCs in stained smear of faeces.

**E) Mucus in the faeces:**

The mucus in faeces may be present in case of:

1- Constipation.

2-Parasitism

3- Bacterial diseases as colibacillosis and salmonellosis.

**II. Microscopic examination**

**I. Qualitative method:**

**A. Direct smear:**

**a. Unstained smear:**

**• Technique:**

Put small quantity of faeces on slides, then mixed with drop of water, then covered with cover slip and examined directly by low power the microscope.

N.B: At least 3 slides from different parts of the faecal sample should be examined.

**b. Stained smear:**

**i. Iodine slanted smear:**

**• Technique:**

Put a small piece of faeces on a slide, then add few drops of lugols, then covered with cover slip and examined directly by low power of the microscope.

- **Result:** Protozoal cysts and trophozoite is stained by brown colour.

#### **ii. Eosin stained smear:**

- **Technique:** as iodine stained smear but use eosin instead of lugols.
- **Result:** smear is pink while cysts and trophozoite are colourless.

#### **iii. Methylene blue stained smear:**

- **Technique:** use methylene blue (0.1 %) instead of lugols.
- **Result:** used for diagnosis of liver fluke, the back ground is blue while the egg is yellowish.

#### **Preparation of flotation solution:**

##### **1- Sugar flotation solution (sheather's solution):**

- **Reagent:** 454 gm table sugar + 300 ml water + 6 ml 40% formaldehyde or (1 gm crystalline phenol in 100 ml solution).

- **Technique:**

Heat the water (not boil), and the sugar while stirring, after mixing add the formaldehyde or crystalline phenol as preservative and prevent from growing, adjust the specific gravity by addition of sugar or water.

- **Technique:**

- 1- Placed 2-5 gm of faeces in a suitable container such as paper cup.
- 2- Flotation solution is added directly to the faeces and mixed thoroughly.
- 3- Straining through tea strainer into a second paper cup.
- 4- The content of second paper cup are poured into a test tube and the flotation medium is added until meniscus is formed.
- 5- A glass cover slip is placed over the meniscus
- 6- Wait for 10-15 minutes.

7- The cover slip is removed from the liquid and examined with low power microscope.

**Centrifugal flotation:**

• **Advantage:**

- 1- More time is saved.
- 2- Greater accuracy is obtained.

• **Technique:**

- 1- Samples of 2-5 gm are well mixed with water (about 30-50 ml).
- 2- Straining through sieve (tea strainer).
- 3- Centrifugation for 2-3 occasions, until the supernatant is clear.
- 4- The sediment is then mixed with saturated solution in centrifugal tube.
- 5- Centrifugation for 1500 rpm /minutes.
- 6- Touch the surface of tube with glass rod and transferred to slide.
- 7- Examination under low power microscope.

**Sedimentation technique:**

**Washing and sedimentation:**

• **Indications:**

- 1- Detect the most parasite eggs.
- 2- Detect eggs or cysts that have too high specific gravity to float or that would be severely distorted by flotation.
- 3- In case of round and tape worm eggs, there is usually too much faecal debris hiding the eggs to be clear.
- 4- The main indication is the detection of trematodes eggs (fasciola and parmiphistomum eggs).

• **Technique:**

- 1- Mix 2 gm of faeces with tap water in cup or beaker and make a suspension.
- 2- Sieving through tea strainer into centrifugal tube.
- 3- Centrifugation at 1500 rpm /minutes.
- 4- Small amount of sediment transferred to microscope slide and diluted with drop of lugol's iodine (diluted 1:5 in water), identify the protozoan cysts and put cover slip to the drop.
- 5- Examination by low power of microscope.

**Examination of faeces for protozoa:**

Protozoa may be in the form of cysts (have a rigid wall) or trophozoites (lack the rigid wall of cyst).

**a. Examination of faeces for the cysts:**

By staining as in stained faecal samples.

The staining may be by:

- 1- D. Antoni's iodine solution (100 ml distilled water 1 gm potassium iodide, 1.5 gm iodine crystal).
- 2- Lugol's iodine.
- 3- Eosin.

**b. Examination of faeces for trophozoit:**

1. By their movement:

- To observe live trophozoites, physiologically saline must be used to dilute the faeces .
- Trophozoites are recognized by their movement as follows:
  - *Blantidium coli* move in slow tumbling fashion.
  - *Giardia* species swims in jerky motion.

- Trichomoads ripples as they swim.
- Amoebia moves by extending parts' of their cell body (pseudo pod) and moving the rest of the body after it.

2- By staining with Giemsa's or Wright's stains.

### **3- Blood examination**

**Indications:**

**1. Diagnosis of blood parasites as:**

- i. Babesiosis
- ii. Theileriosis
- iii. Filariasis
- iv. Typanosomiasis

**2. Diagnosis of certain bacterial diseases as:**

- i. Leptospirosis.
- ii. Pasteurellosis.
- iii. Anthrax.

**3. Diagnosis of certain blood diseases as:**

- i. Leukemia
- ii. Infectious mononucleosis
- iii. Sickle cell anaemia
- iv. Pernicious anaemia

**Collection of blood sample:**

Sites of blood collection in different animals are:

<b>Animal species</b>	<b>Site of blood collection</b>
Cattle and buffaloes	Jugular and ear veins
Camel	Jugular and tail veins
Sheep and goat	Jugular vein and not ear vein
Horse	Jugular vein
Pig	Ear vein and anterior vena cava

Dog	Cephalic and recurrent tarsal veins
Poultry and laboratory animals	Heart

**Time of collection:**

- It is preferable to collect the blood sample during the feverish stage of the disease course.

**Preservation of blood sample:**

Anticoagulants	Concentration
EDTA	20 mg/ 10 ml blood
Pot. oxalate	20 mg/10 ml blood
Sod. fluoride	40 mg/ 10 ml blood
Sod. citrate	60 mg/10 ml blood
Heparine	few drops of 1% solution
Pot. and ammonium oxalate mixture	1 ml/ 10 ml

**Types of blood films**

- 1- Wet blood films.
- 2- Thin blood films.
- 2- Thick blood films.

<b>Wet blood films</b>	<b>Thick blood films</b>	<b>Thin blood films</b>
1. Indicated mainly for detection of trypano-somes and microfilaria	1. For extracellular micro-organisms (m.o)	1. For intracellular m.o
2. Immediate diagnosis of m.o on the spot is possible.	2. Immediate diagnosis of m.o on the spot is not possible.	2. Immediate diagnosis of m.o on the spot is not possible.
3. A field microscope is needed.	3. A field microscope is not needed.	3. A field microscope is not needed.
4. Specific diagnosis is not possible.	4. Specific diagnosis is sometimes possible	4. Specific diagnosis is possible
5. Sensitivity is limited	5. Sensitivity is limited	5. Sensitivity is extremely low

**Preparation of blood films:**

**A. Wet blood films:**

1. A small drop (about 2  $\mu$ l) of blood is placed on to a clean glass slide.
2. Then covered with a cover-slip to spread the blood as a monolayer of cells.
3. This is examined by light microscopy (200) to detect any motile trypanosomes or microfilaria.

The diagnostic sensitivity of the wet blood film is generally low and can be improved significantly by lysing the RBCs before examination using a haemolytic agent such as sodium dodecyl sulfate (SDS) or saponin.

### **B. Thick blood films:**

#### **Procedure:**

Fresh, whole blood collected without anticoagulants.

1. Using a wooden stick or glass capillary, place a large drop (about 7.5  $\mu$ l) of well-mixed blood in the centre line of a slide about 1 cm from one end.
2. Without delay, place a spreader in front of the drop at an angle of about 45°C to the slide.
3. Move it backwards to make contact with the drop. The blood should run quickly along the contact line.
4. With a steady movement of the hand, spread slowly the drop of blood along the slide with equal pressure (the weight of slide is the only pressure applied).

#### **Staining of blood film**

A- Giemsa stain method.    B- Leishman's stain method

C- Field's stain method                      D- Wright's stain method

#### **A. Giemsa stain method:**

Giemsa stain is a good method for routine work and it is available as a powder or as a stock solution.

#### **Procedure of staining:**

1. Fix the thin film in Methanol (absolute, acetone-free) for 2-3 minutes at room temperature. This can be done simply by immersing the film in Methanol or by putting a few drops of Methanol on it



using a pipette (It is important to note that thick films are not fixed prior to staining).

2. Remove methanol by tilting the slide or by simply removing from the fixing jar then allow the slides to air dry.
3. Immerse the dried slides in the working stain solution for 10-60 minutes (a good general rule for stain dilution versus staining time is as follows; if dilution is 1:10, stain for 10 mins.; if dilution is 1:20 stain for 20 mins; etc).
4. Wash under gently running tap-water and then leave for 3-4 minutes in buffered distilled water, pH 6.8.
5. Drain thoroughly in vertical position and allow to air dry. Mount with a coverslip if required, using DPX neutral mounting medium.

#### **4. Skin examination**

##### **Definition:**

It is one of the important laboratory aids that used for diagnosis and differential diagnosis of skin diseases.

##### **Indications:**

1. Used for diagnosis of skin diseases including parasitic, fungal and bacterial infection.
2. Differentiate the types of mange.

##### **Skin scraping for mange:**

- I- Collection of samples.
- II- Methods used for examination.
  - A- Direct smear method.
  - B- Sedimentation method.
  - C- Sugar flotation method.

## **I. Collection of sample:**

### **• Site of collection:**

The scrapings must be collected from the periphery of the most affected and recent area as there is more parasites on this area than in any others one.

### **• Technique of collection:**

1. Clip the hair or the wool around the area examined.
2. Moisten the affected part with mineral oil or 10% potassium hydroxide.
3. The lesions on the skin are pressed with thumb and index finger of left hand and scrap the skin with right hand using scalpel dipped in mineral oil.
4. The scraping should be collected so deep that some blood must ooze out from peripheral of the lesion.
5. Skin scrapings are collected in 10 % potassium hydroxide or in glycerine and transported to laboratory after sealing proper identification.

## **II- Methods used for examination:**

### **A) Direct smear method:**

1. Potassium hydroxide treated skin scrapings are placed on clean dry glass slide.
2. Put one drop of 10% potassium hydroxide or sodium hydroxide 10%
3. Cover it with coverslip.
4. Examine under low power microscope.

### **B) Sedimentation method:**

1. Skin scrapings are kept in 10 % potassium hydroxide or sodium hydroxide 10 % for (2-4) hours to digest the debris or the digestion process accelerated by providing gentle heating .
2. Centrifugation at 3000 rpm /10 minutes.
3. Supernatant is discarded.
4. One drop of sediment placed on middle of clean slide and cover by coverslip.
5. Examine under low power microscope.

#### **I. Collection of sample:**

- **Site of collection:** The same site as for mange.
- **Technique of collection:**
  1. Before collection, the skin is swabbed with 95% alcohol to remove any saprophytic microorganisms.
  2. Scalpel moistened with mineral oil.
  3. Skin scraped deeply to include the hairs.
  4. Scraping put in potassium hydroxide 10%.

#### **II. Methods used for examination:**

- A) Gross examination:** performed on the intact skin to detect the presence of ring worm.
- **Technique:**
    1. Swabbing to the affected area of the skin with chloroform.
    2. Left for few minutes.
  - **Result:** in fungal infection, the swabbed area becomes white in colour.

**B) Wood's lamp (Ultra violet) method:**

• **Technique:**

The wood's lamp directed on scrapings collected in Petri dish or on intact affected area of skin.

• **Result:**

1. Yellow green fluorescence indicates *Microsporum* species.
2. No fluorescence indicates *Trichophyton* species.

**C) Microscopic examination:**

**a) Direct examination:**

• **Technique:**

1. Skin scraping placed on slide with one drop of 10% potassium hydroxide.
2. Cover it with cover slip and apply Vaseline around the rim of coverslip.
3. Warming to the slide with gentle heating.
4. Examine under low power microscope.

**b) PAS staining (Periodic Acid Shaft).**

After staining with PAS staining the fungi will take a bright red or purplish red colour when examined under microscope.

## **5. Diagnosis of mastitis**

**Diagnosis of mastitis depends on:**

**I- Case history**

**II- Clinical examination of animal and its udder**

**III- Examination of milk**

**A- Collection of milk sample**

**B- Preservation of milk sample**

## **C- Laboratory tests for milk examination**

### **a- Indirect tests**

- i. Strip cup test.
- ii. Specific gravity.
- iii. Detection of pH.
- iv. Catalase test.
- v. Chlorine test.
- vi. White side test.
- vii. California mastitis test.
- viii. Wisconsin test.
- ix. Electric conductivity
- x. Detection of inflammatory mark of subclinical mastitis

### **b- Direct tests**

- i. Incubated smear technique.
- ii. Bacterial count
- iii. Leukocytic count.
- iv. Hotis test
- v. Cultural examination and Antibiotic sensitivity.
- vi. Diagnosis of Tuberculosis mastitis

### **Clinical examination of animals and its udder:**

1. to skin of udder and teat to presence of external Inspection of the udder and teat to detect the symmetry of quarters. During acute or chronic mastitis, there is asymmetry to the udder quarter and teat.
2. Rectal temperature to show systemic reaction and so detect it is acute or chronic.
3. Palpation of super mammary lymph nodes if suspected tuberculosis or acute infection.
4. Superficial then deep palpation of udder tissue as a rule of chronic mastitis is progressive and ascending infection and also detects the sign of inflammation.

5. Examination the teat orifice and teat canal to presence of obstruction.
6. Examination lesion on the skin.

**Examination of the milk:**

**A. Collection of milk sample for bacterial examination or cell count:**

1. Udder is thoroughly cleaned with water and antiseptic as potassium permanganate 1/1000 then dried with clean towel.
2. Hand of clinician or person collecting milk should also clean with soap and antiseptic.
3. The tip of the teat should be whipped with swab dipped in 70% alcohol and then dry.
4. Extruding the external orifice of the teat by pressure and ensure that dirties and wax are removed from it.
5. The first 3-4 stream of milk should be discarded into strip cup.
6. Collect 5-10 ml of milk from each teat in separate wide mouthed screw capped bottle which is held in horizontal position.
7. If tuberculosis is suspected the last 200 ml should be collected.

**B. Preservation of the milk sample:**

1. Examination should be immediately or within 3-5 hour to avoid scouring of milk. If delaying of examination is suspected, the sample should be kept for not more than 24-30 hour.
2. Other preservative as formalin, mercuric chloride, pot. dichromate and boric acid 0.5% can be used but these preservative is not used in indirect tests because they alter the DNA.

### **C. Laboratory tests for milk examination:**

#### **a) Indirect test:**

##### **1. Strip cup test:**

**Definition:** is primary screening test used for detection of macroscopic changes in the milk for evidence of clinical mastitis.

##### **Technique:**

1. Enamel plate divided in 4 strip cup, the bottom of the plate is black to detect the milk flakes.
2. Put milk sample from each in quarter in corresponding cup.
3. Tilting the cups at an angle to see the flakes.

##### **Interpretations:**

Presence of flakes indicates clinical mastitis (subacute and acute), so the animal isolated for confirmatory diagnosis and treatment.

##### **Presence of reddish or bloody milk indicates:**

i. Acute or per acute mastitis: As in case of:

- Clostridium perfringens type A.
- Staph. aureus.
- Bacillus cereus.
- Pasteurella haemolytica.
- Pasteurella multocida.
- Leptospirosis.
- Anthrax.

ii. Colostrum of some breed.

iii. After calving for first week in heavily producing animal.

iv. Direct trauma to the udder.

v. Phenothiazine treatment (pink or brown milk).

##### **Presence of yellowish milk indicates:**

i. Colostrums.

ii. Feeding of carotene.

iii. Tetracycline and acridine dyes.

Presence of watery milk indicates: chronic mastitis and poor feeding.

Tuberculous mastitis: the milk in early stage is normal while later, ampere fluid is obtained after the milk stand.

Presence of the foul odour indicates *Actinomyces pyogenes* (summer mastitis).

Presence of sweet or fruity odour indicates ketosis.

## **2. While side test:**

### **• Principle:**

Reaction between DNA released from the cells (somatic cells or bacterial cells) with the reagent (Sod. hydroxide 4%). The samples should taken from the bulk milk due to the fat in the milk (cream) is essential factor in the test.

### **• Technique:**

Few drop of milk with equal amount of Sod. hydroxide 4% on clean dry slide.

### **• Interpretations:**

1- Fine granules indicate +ve.

2- Flakes and shreds indicate ++ve.

3- Viscous gel with watery back ground indicate +++ve.

## **3. California mastitis test (CMT):**

The test depends on reaction between DNA of the cells in the milk (somatic cell and bacteria) with anionic reagent (alkyl aryl sulfonate).



• **Technique:**

- 1- Put 3 ml of milk from each quarter into one of 4 shallow cups of the plastic paddles.
- 2- Add equal amount of the reagent on the milk in each cup.
- 3- Mixing in circular rotation.

• **Results:** within 30 seconds as follow:

- 1- No precipitate or granules indicates a -ve result.
- 2- Slight precipitate or granules is doubtful.
- 3- Streaky fluid (flakes) indicates +ve.
- 4- Slimy indicates ++ve.
- 5- Gelatinous indicates +++ve.

• **Interpretation:**

<b>Results</b>	<b>Suspected somatic cells/ml of milk</b>	<b>Loss of milk yield</b>
Doubtful	150000-500000	6%
+ ve	400000-1500000	10%
++ ve	800000-5000000	16%
+++ ve	More than 5000000	24%

• **Advantage:**

- 1- Detect 90% of positive cases.
- 2- Most efficient indirect test.
- 3- Used as screening and control of mastitis.

• **Disadvantage:**

- 1- Does not indicate the nature and degree of positive infection.
- 2- Give false positive in early and late lactation.

3- Depend upon the experience.

**Electric conductivity:**

**Principle:**

In case of subclinical mastitis, the milk has small amount of lactose. The osmolarity of milk must be remain comparable to that of blood, thus the mammary membrane allow transfer of salt from the blood serum to maintain osmotic equilibrium because lactose is non conductive and serum salts conduct electrical current. The conductivity of milk increase as the milk becomes abnormal.

**Technique:**

Positive and negative electric rods inserted in milk sample and then detect electric conductivity.

**Results:** Electric conductivity of the milk increase in subclinical mastitis.

### A- Anthelmintics

A- Anthelmintics				
Active principle	Trade name	Dose	Route	Indications
<b>1- Albendazole</b>	-Pan-Helmin 2.5% (Abrar) -Albendazole 5% (MID)	Cattle 15 m/50 kg B.W Sheep 2 ml/10 kg B.W.	Orally	- Round, tape & lung worms - Mature liver flukes
<b>2- Closantel</b>	- Fasciontel 5% (Lab. Tome)	1 ml/10 kg	S/C	- Round worms ((GIN) - Mature & immature liver flukes - Oestrus ovis
<b>3- Clorsulon + Ivermectin</b>	- Ivermectin super (Abrar) - Iver plus (Prima Vet.)	1 ml/50 kg	S/C	-Internal & external parasites. - Mature & immature liver flukes
<b>4- Dorameetin</b>	- Dectomax, 10 mg/ml (Pfizer)	1 ml/50 kg	I/M –S/C	- Round & lung worms - Eye worms, mange, warbles & lice
<b>5- Fenbendazole</b>	- Pancur (powder) (Intervet) - Rintal (tablets)	5 – 10 mg/kg	Orally	- Round & lung worms
<b>6- Ivermectin</b>	- Univomec 1% (Abrar)	1 ml/50 kg	S/C	- Round & lung worms - Eye worms, mange, warbles & lice

Active principle	Trade name	Dose	Route	Indications
<b>7- Levamisole</b>	- Vermisole 7.5% (Bimecla) - Ucimisole 10% (Ainoun)	5.5-11 mg/kg B.W.  3.3- 8 mg/kg B.W.	Orally  S/C	- Round & lung worms  - Non-specific immunostimulant
<b>8- Netobimin</b>	- Hapadex 5% (Schering)	7.5 mg/kg B.W.	Orally	- Round, tape & lung worms

				- Mature liver & rumen flukes
<b>9- Nitroxylinil</b>	- Dovenix 25% - Fasciolid 25% -Distomacide 25%	1 ml/25 kg	S/C	- Mature & immature liver flukes -Haemonchosis - Bunostomiasis - Ospbagostomiasis - Oestrus ovis
<b>10- Oxfendazole</b>	- Systamex (Wellcom) - Synntliic -Tyvert	2.5 mg/kg	Orally	- Round, tape & lung worms
<b>11- Piperazine</b>	- Piprazine citrate	100-300 mg/kg	Orally	- Ascaridia
<b>12- Pyrantel tartrate</b>	- Banminith (Pfizer)	25 mg/kg	Orally	- Round & lung worms
<b>13- Thiabendazole</b>	- Thibenzole 75% (MSD)	50-100 mg/kg	Orally	- Round worms (GIN)
<b>14-Trichlabendazole</b>	- Fasinex 10% (CIBA-GEIGY)	12 mg/kg	Orally	- Mature & immature liver flukes

### B- Antibiotics

Active principle	Trade name	Dose	Route	Indications
<b>1- Amoxicillin sodium</b>	- Amoxil	22 mg/kg	I/M	Broad spectrum bactericidal (BSB)
<b>2- Amoxicillin trihydrate</b>	-Clamoxyl LA 15% (Pfizer) - Trioxyl LA 15% (Univet)	4-22 mg/kg	I/M-S/C	- BSB
<b>3- Ampicillin sodium</b>	- Farcocillin	22 mg/kg	S/C-I/V	- BSB
<b>4- Ampicillin trihydrate</b>	- Ampicillin 20% (Bremopharma)	4-22 mg/kg	I/M-S/C	- BSB
<b>5- Amprolium hydrochloride</b>	- Amprolium 20% (Adwia) - Amproxin (Pharma Sweed)	Cattle 5-10 mg/kg Sheep 55 mg/kg	PO PO	- Coccidiosis
<b>6-Cefotaxime sodium</b>	- Cefotaxime (Prima Vet)	cattle 15ml/100 kg	I/V	- BSB

<b>7- Cefuroxim</b>	Zinnat (1 amp. = 500 mg )	250 TD	I/M	- BSB
<b>8 - Cephacetrile sodium</b>	- Vetimast (Novartis)	250	I/M	- Mastitis in lactating cows
<b>9- Chloramphenicol sodium succinate</b>	NR			
<b>10- Chlortetracycline</b>	- Chlormycin (Abrar)	10 gm/catle 1 tablet/40 kg B.W.	Orally	- Enteritis. - Local mastitis
<b>11- Cloxncillin sodium</b>	- Cloxadry (Depac)	200 TD	I/M	- Mastitis during dry period
<b>12- Danofloxacin</b>	- Advocin, 25 mg/ml (Pfizer)	0.8	I/M-I/V	- BSB mainly for respiratory infections

PO: per os.

<b>13- Enrofloxacin</b>	- Enroflox 10% or 5% - Spectrama-Vel 10% (Amoun)	1 ml/40 kg B.W daily for 3-5 days	S/C I/M	For respiratory infection
<b>14- Florfenicol</b>	- Nuflor, 300 mg/ml (Schering)	1 ml/15 kg B.W. 2 dose 48 hours interval	I/M	- Respiratory infections - Intestinal infection
<b>15- Gentamycin sulfate</b>	- Gentaprima (Prema Vet.)	4 ml/100 kg B.W.	I/V I/M	- Urinary infections. - Genital infections.
<b>16- Isoniazid</b>	Isocid fort (1 cap . = 200 mg )	20	PO	- Actinomycosis - Actinobacillosis
<b>17- Neomycin</b>	- Neomycin 25% (Nile com.)	3-6 mg/kg B.W. 22 mg/kg B.W.	PO S/C	- Enteritis in calves & lambs
<b>18 - Oxtetracycline</b>	- Oxy 5% (Abrar) - Oxyprima 20% LA (Prema Vet.)	10 ml/100 kg B.W.	I/M	- Respiratory infections - Genital infections.
<b>19- Penicillin G, benzthine</b>	Aqua Pen (Cid)	44,000-66,000 iu	I/M-S/C	- Most Gram + ve bacteria
<b>20- Penicillin G procaine</b>	Penicillin Procaine (Cid )	10,000-60,000 iu	I/M-S/C	- Most Gram -ve bacteria
<b>21- Streptomycin</b>	- Streptomycin sulphate (Nile com)	11 mg/kg	I/M-S/C	- Gram -ve bacteria - Leptospirosis
<b>22- Sulfadimidine</b>	- Sulfadimtdine33.3% (Vetwic) - Uni-Sulfa 33% (Amoun)	100-200 mg/kg loading dose then 50-100	I/V	- Systemic infections
<b>23-Sulfadoxine/ trimethoprim</b>	- Borgal 24% (Intervet)	15 mg/kg	I/V	- Systemic infections

	- Sulpatrim tablet	1 tablet/40 kg	Orally	- Pasteurellosis.
<b>24- Tylosin</b>	- Tylovet (Pharma Swede)	17mg/kg	IM	- Mycoplasmosis

**C-Anti-inflammatory, analgesic and antipyretic**

<b>Trade name</b>	<b>Active principle</b>	<b>Dose</b>	<b>Route</b>	<b>Indications</b>
- Declofenac sodium (Abrar) - Declofenac sodium (Prima Vet.)	<b>1- Decloflam 2.5%</b> <b>Decloprema 5%</b>	4 ml/100 kg 2 ml/100 kg	I/M I/M	Analgesic, anti-inflammatory, antipyretic & antiendotoxic
Dexamethasone 0.2%	<b>2- Dexamethasone</b>	15 ml/500 kg B.W	I/V-I/M	Anti-inflammatory and antiallergic
Finadyne 5% (Shering)	<b>3- Flunixin miglumine</b>	1 ml/45 kg	I/M-I/V	Anti Inflammatory, analgesic & anti-endotoxin

**D- Drugs used for treatment of blood parasites**

<b>Trade name</b>	<b>Active principle</b>	<b>Dose</b>	<b>Indications</b>
Quinuronium sulphate	Acaprin (Bayer) 5% Inj.	1 ml/50 kg S/C in tail fold	For treatment of Babesiosis
Buparvaquone	Butalex ® (Coopers)	1 ml/20 kg I/M	For treatment of Theileriosis
Suramin	Naganol ® (Bayer)	10 mg/kg 10% solution I/V	For treatment of Trypanosomiasis
Diminazene and Antipyrin	Berneil (Hoechst)	1 ml/20 kg	For treatment of Babesia and Trypanosoma
- Diminazene aceturate + phenazone (Abrar)	Batrynil 7.5%	1 ml.20 kg	- Babcsiosis - Anaplasmosis - Trypanosomiasis
- Imizol (Shering)	Imidocarb dipropionate	1.2	- Babesiosis - Anaplasmosis

### **Main causes of antibiotic failure:**

- 1- Exposure of the drug to strong sunlight.
- 2- Too much water is added.
- 3- The causative agent is virus or blood parasite.
- 4- The drug is not specific against the pathogen.
- 5- Contaminated needle back into the bottle.
- 6- Duration of the drug is not enough.
- 7- Frequency of dose (some drugs should be given daily but some doctors decide to double the dose and give it every two days).



## REFERENCES

- Ahmed A. El-Sawalhy (1997):** Veterinary Infectious Diseases.
- Radostits O.M., Blood D.C. and Gat C.C. (2004):** Veterinary Medicine. 10<sup>th</sup> Ed., Bailliere Tandal.
- Blowey R.W. and Wear A.D. (1991):** Colour Atlas of Diseases and Disorders of cattle. Wolf Publishing Ltd, 2-6 Torrington place, London WC1E 7LT, England.
- Hamed Attia and Hatem Selim (1999):** Handbook of Veterinary Internal Medicine. Zagazig, Egypt. Al-Ahram Distribution Agency.
- Illumination on Practical Course of Infectious Diseases.** Department of Animal Medicine (Infectious Diseases), 2008.

أماكن تسويق مجموعة الكتب الخاصة بالدكتور / حامد  
عطيه

1- محافظة الشرقية: مكتبة عباده بجوار محل الغزوى التجارى - شارع  
المكاتب بالزقازيق.

مكتبة عباد الرحمن - برج الصيادلة - بجوار كلية  
الطب البيطرى - جامعة الزقازيق.

2- محافظة الدقهلية: مكتبة شجرة الدر - بجوار كلية الطب البيطرى -  
جامعة المنصورة (المبنى القديم).

3- محافظة كفر الشيخ: مكتبة الجامعة - - بجوار كلية الطب البيطرى -  
جامعة كفر الشيخ.

4- محافظة القاهرة: كشك أمام كلية الطب البيطرى - جامعة القاهرة.

5- محافظة القليوبية: مكتبة العالمية أمام كلية الطب البيطرى بمشتهر -  
جامعة بنها.

6- محافظة بنى سويف: مكتبة الشبح - بجوار كلية الطب البيطرى -  
جامعة بنى سويف.

7- محافظة أسيوط: مكتبة الاعتصام بجوار سور مدرسة الزراعة.