Clinical Management of blood protozoan diseases in Large Animal Practice

By

Dr.S.Sivaraman M.V.Sc.,Ph.D
Assistant Professor
Dept of Vet Clinical Medicine,
VC &RI, Namakkal. TANUVAS
Tamil Nadu .INDIA

Learning is a Continuous Process

Temperature

- Viral diseases
- Blood protozoan diseases
- Inflammatory Causes
- Bacterial Diseases
- Toxemia or septicemia

Protozoan diseases

- Anaplasmosis
- Theileriosis
- Babesiosis
- Trypanosomiasis

Clinical examination

- Temperature
- Cmm and scleral examination
- Vaginal Mucous membrane
- Heart rate
- Lymph nodes
- Lung auscultation
- Venous stasis?
- Urine colour?

- Inner aspects of ears
- External body surface
- Dehydration
- Udder
- Dung ??

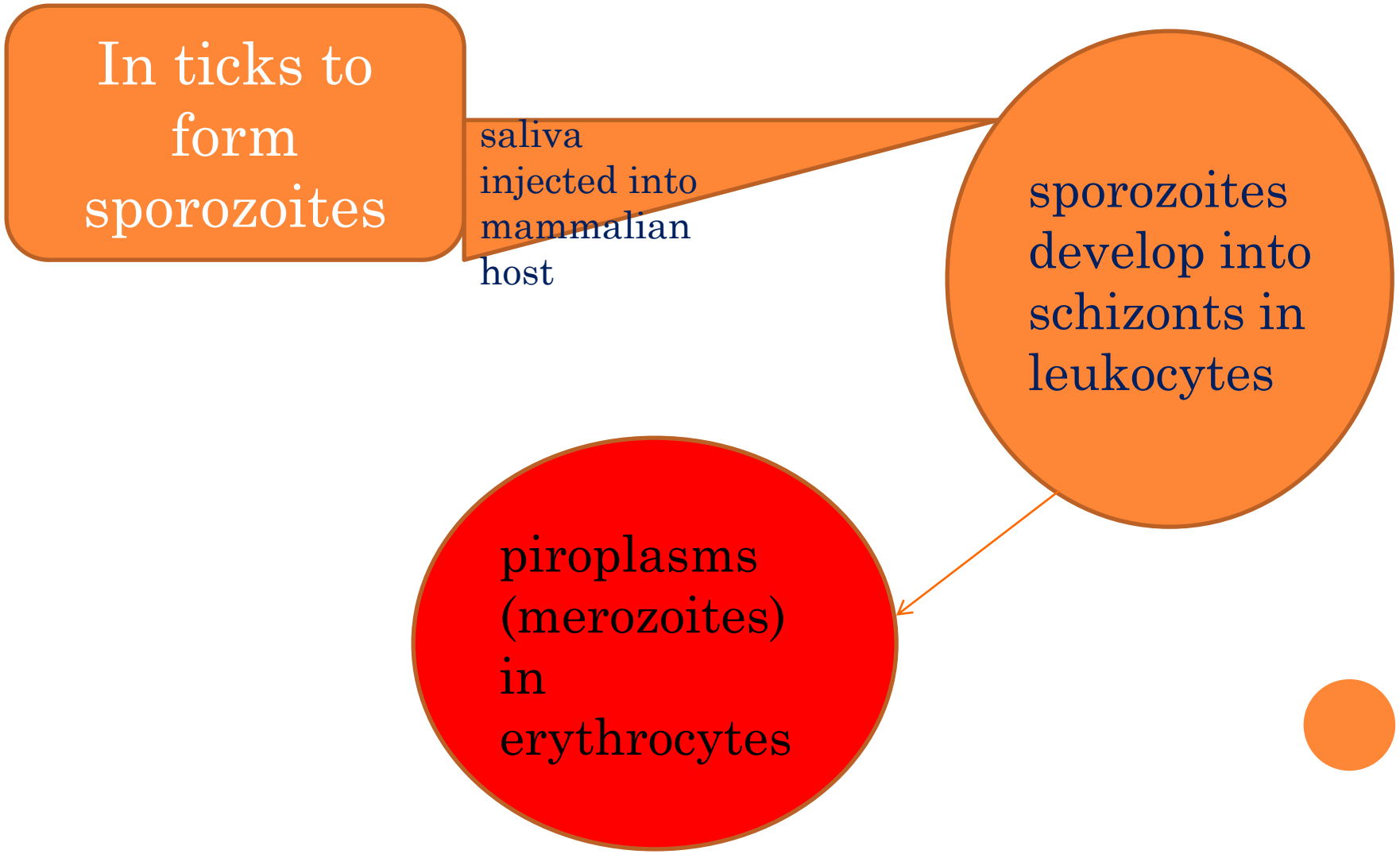
- A CBHF cow was anorectic and had sub normal temperature with pale and icteric cmm ,enlargement of pre scapular lymph node ,resp distress and nasal discharge.

- What's your diagnosis and how will you proceed in treatment?

THEILERIOSIS

Disease Name	Theileria spp	Ticks
Tropical theileriosis (Mediterranean coast fever)	*T. annulata*	*Hyalomma anatolicum*
Oriental theileriosis (Japanese theileriosis)	*T. orientalis*	*Haemophysalis* spp.
East coast fever	*T. parva*	*Rhipicephalus* spp.
Turning sickness (cerebral theileriosis)	*T. parva*, *T. taurotragi*	
Benign theileriosis	*T. sergenti*	*Haemophysalis*
Malignant ovine theileriosis	(*T. lestoquardi*)	*Hyalomma* spp
Equine theileriosis	*T. equi*	*Boophilus microplus*, *Rhipicephalus* spp., *Hyalomma* spp.

LIFE CYCLE OF *THEILERIA* CYCLICAL DEVELOPMENT



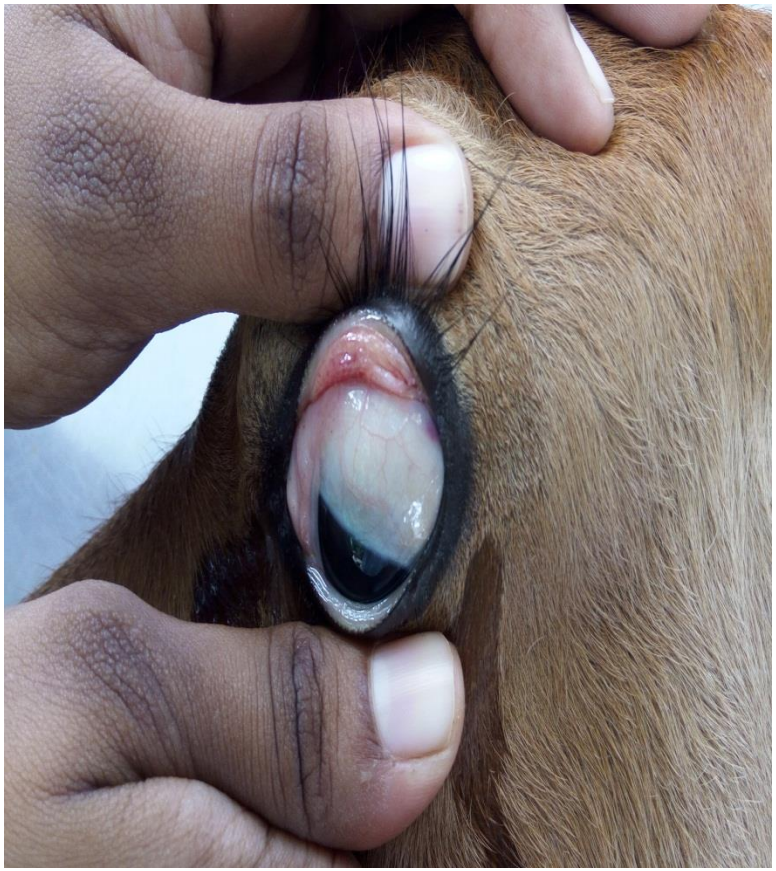
- Transmitted by *Hyalomma* ticks.
- Transplacental (vertical) transmission from pregnant cows to calves
- Recovered animals show long lasting immunity
- Buffaloes are natural hosts and act as carriers

Clinical signs

- Pyrexia
- swelling of superficial lymph nodes
- Pale mucous membranes, icterus,
- Tachycardia,
- Dyspnoea

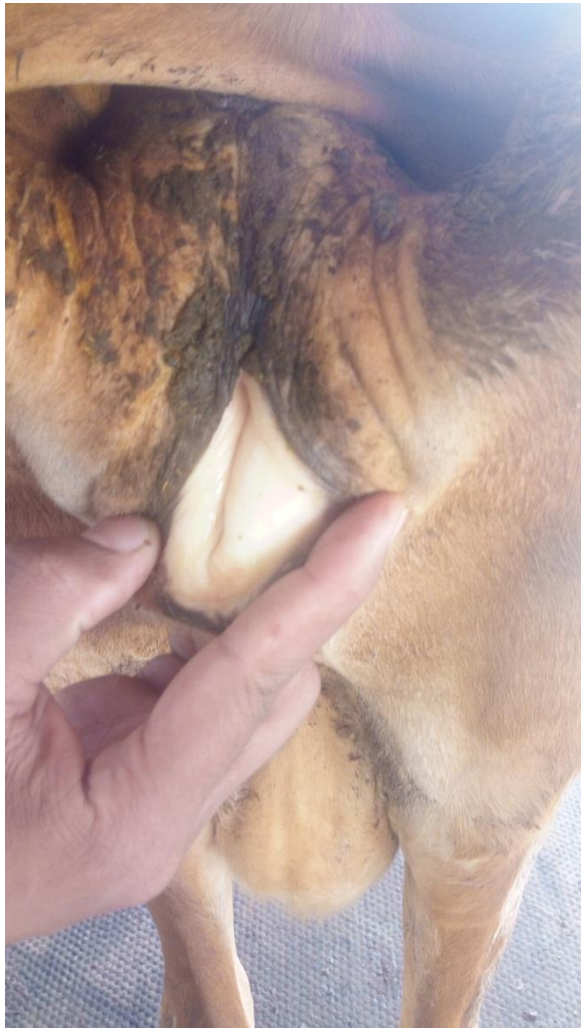
- Others are diarrhoea, weight loss, convulsions, torticollis, and other nervous signs.

Theileriosis in neonatal calf



PETICHAETIONS

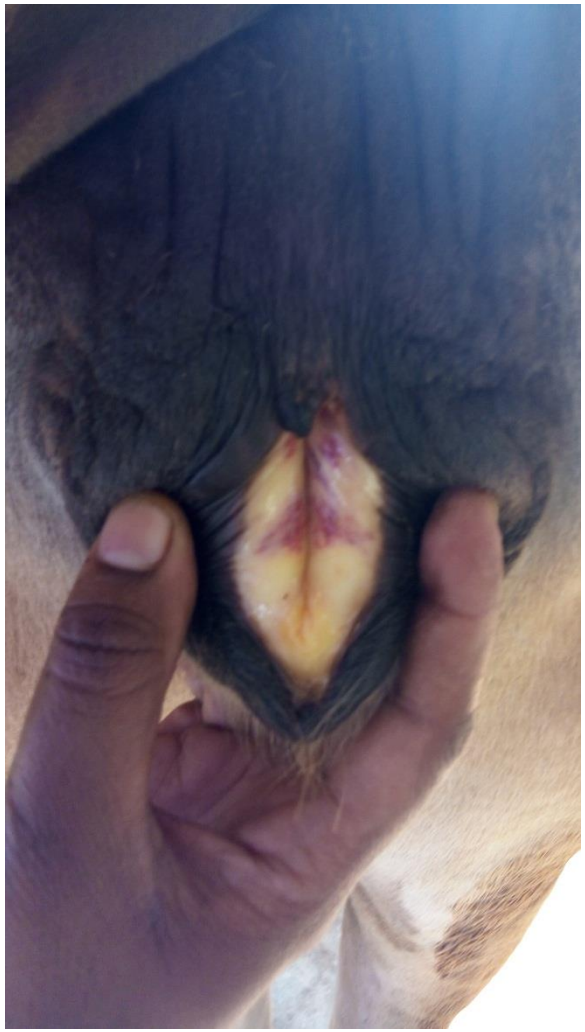
Blanched v mm



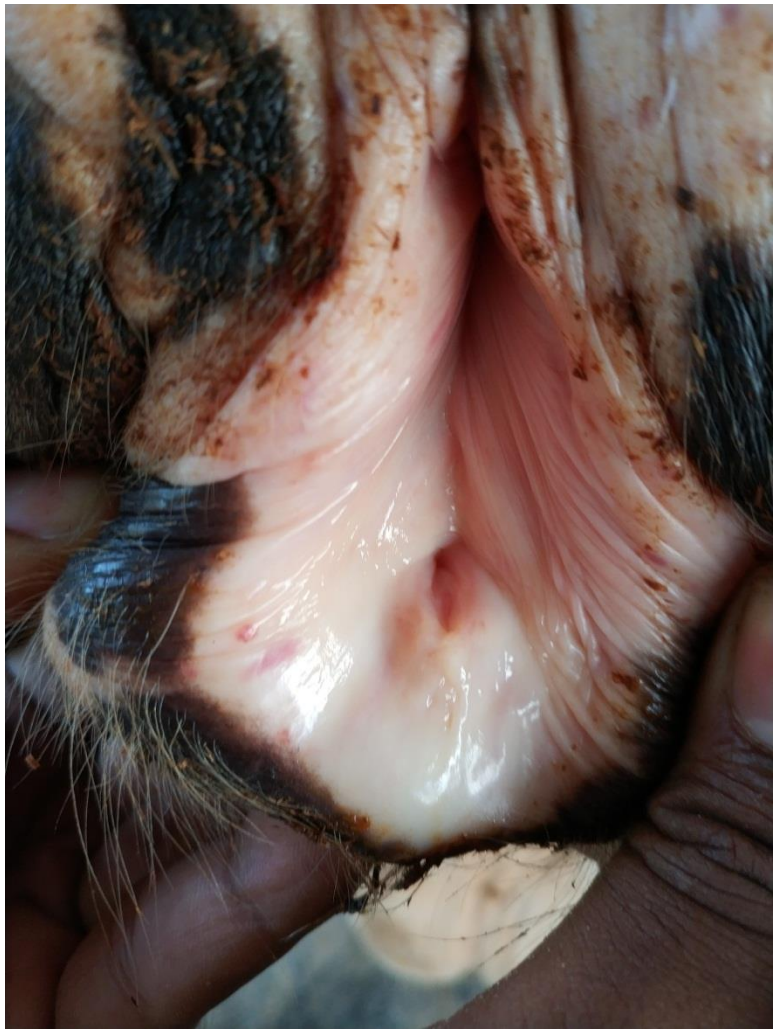
ECHYMOSIS

Pale cmm

Echymosis v mm with icteric



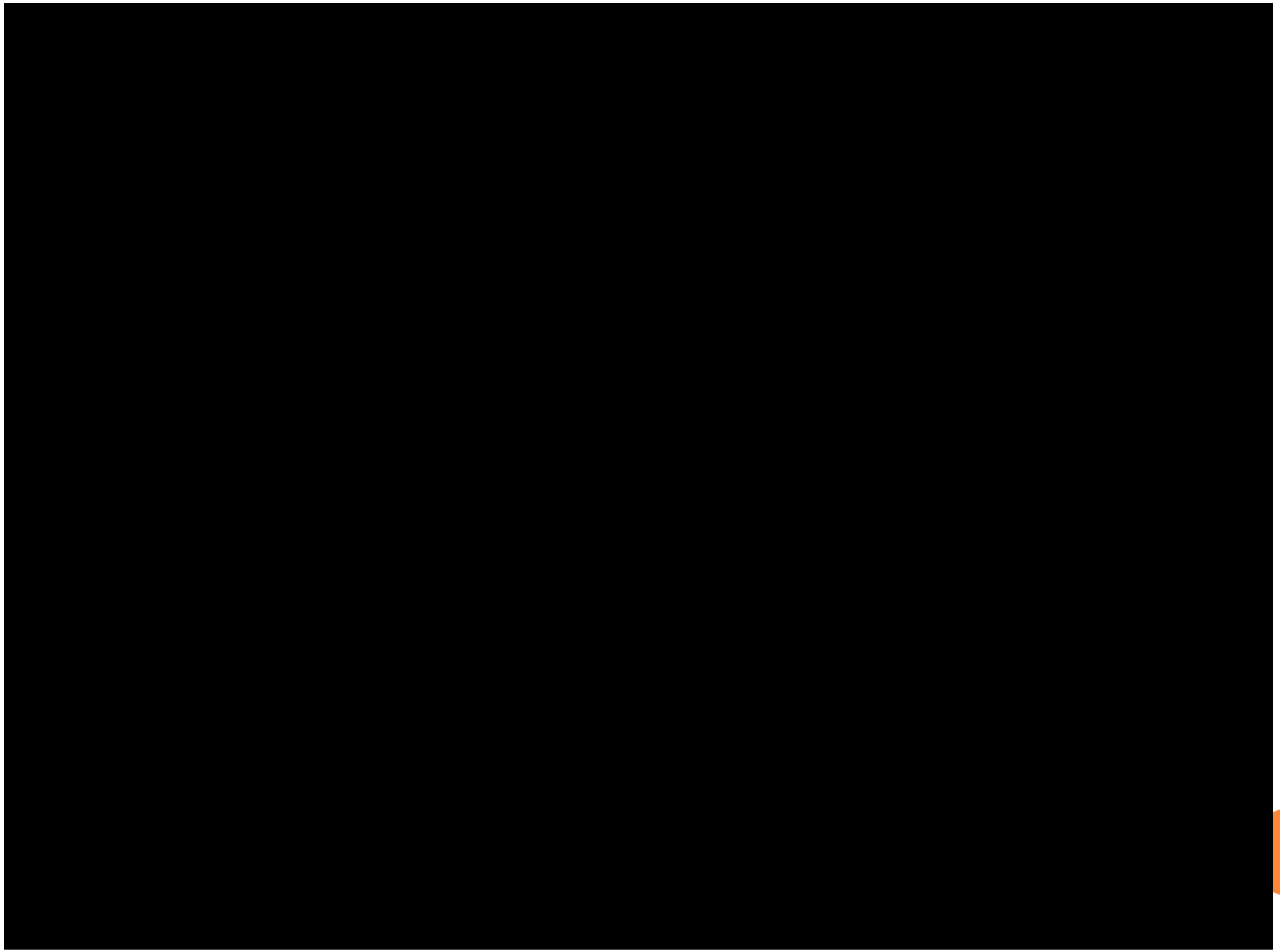
Minute petichations

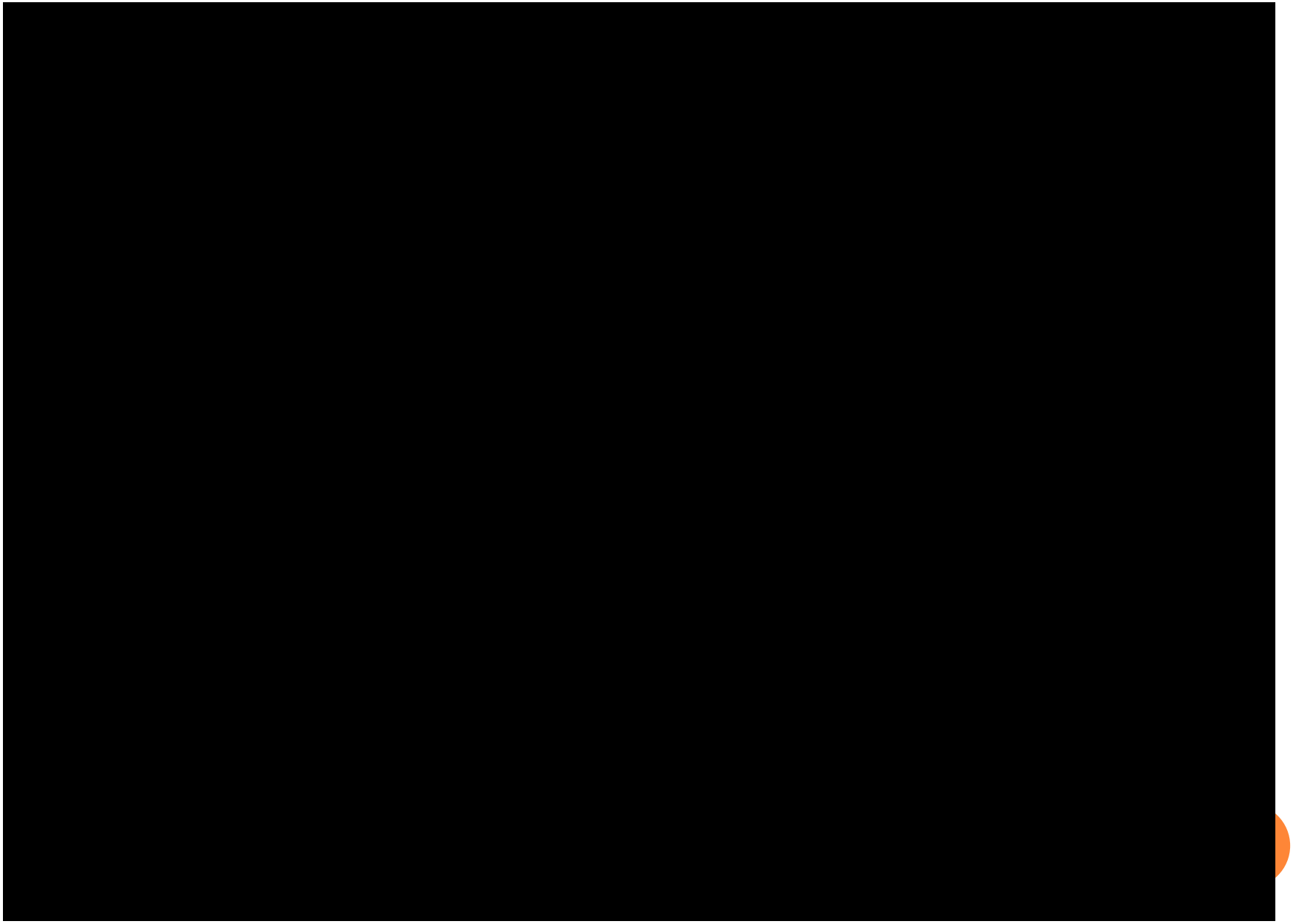


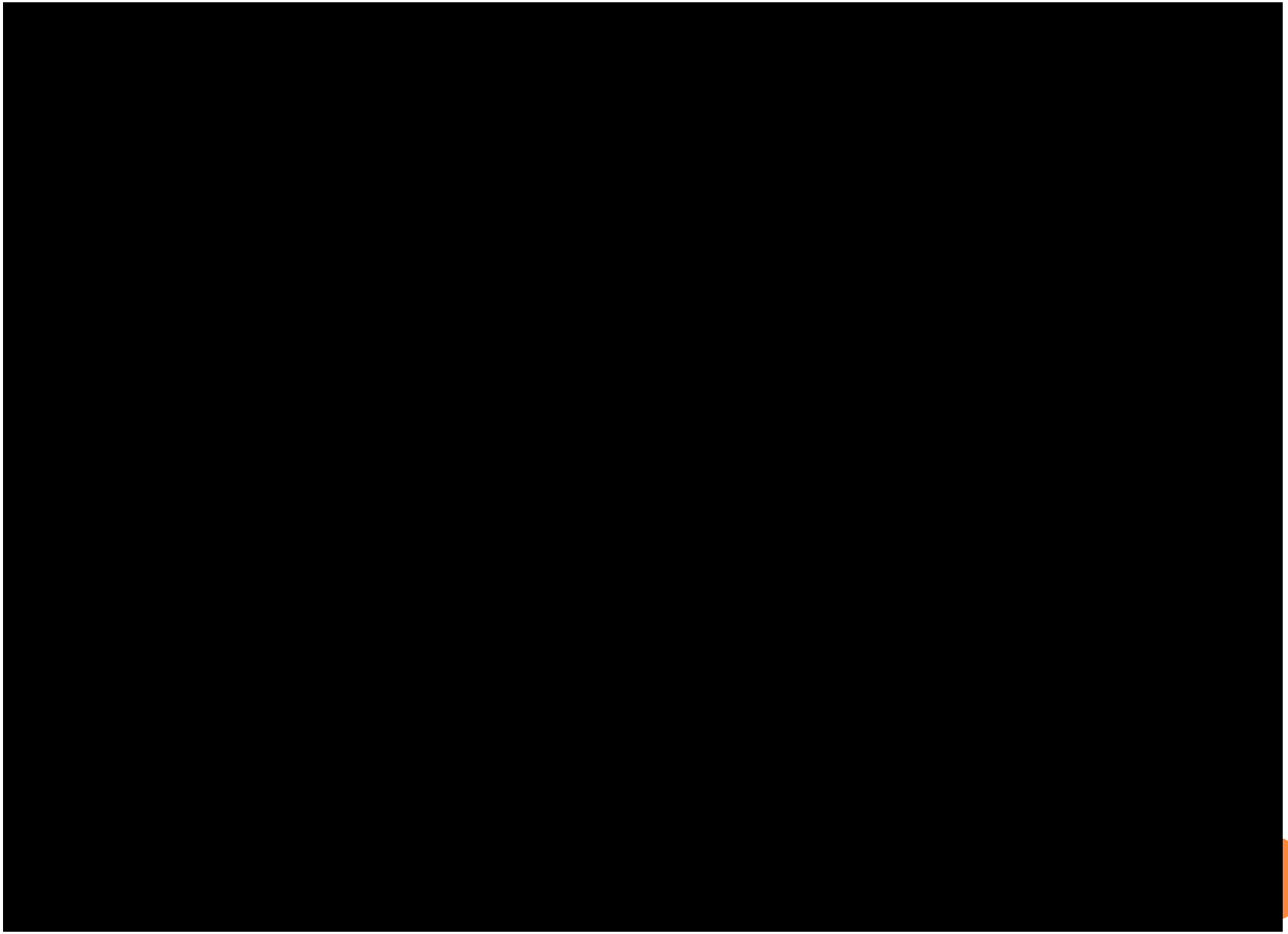
Echymosis in cmm

Pale and icteric

ICTERIC







- Anemia is a significant feature of tropical theileriosis
- In ECF there will be bilirubinemia, hemoglobinuria and bilirubinuria
- Signs like pseudopericarditis??

DIAGNOSIS

- Clinical signs
- Lymph node – FNAB
- Peripheral Blood smear
- CBC

Treatment

- Buparvaquone 2.5 mg/kg IM, 2 doses 48 hrs IM
- Oxytetracycline 20 mg/kg IV or IM
- Halofuginone lactate (1.2 mg/kg PO))
- Blood tansfusion if PCV < 15%
- Supportive treatment of anemia with B Complex
  Vit B12

FAQ??

- Can we give fluids?
- How to access the prognosis ?
- How long we can treat it?
- If no blood transfusion available how to stabilze the animal?
- Why should we give furosemide?

Plasma volume expander

- Affected animals show high fever, lacrimation, nasal discharge, swollen lymph nodes, and hemoglobinuria (ECF)

- Post-mortem lesions include punched-out ulcers in the abomasum, enlargement of the spleen, and massive pulmonary edema

ANAPLASMOSIS

- Anaplasma marginale – cattle, Buffalo, wild ruminants
- *A. ovis* in sheep and goats
- obligate intracellular gram-negative bacteria

- ***A. marginale, A. centrale, A. bovis, and A. ovis***, which are pathogens of ruminants

- ***A. phagocytophilum***, - humans, wildlife domesticated animals

- ***A. platys*** ------- infects dogs

- Transmission----- Ticks,
  Mechanical transfer,
  Biting flies
  Blood contaminated fomites,
  Needles, ear-tagging,
  Dehorning,
  Castration equipments

- Transmission is biologically by ticks
  can also occur transplacentally.

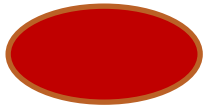
- Mechanical transmission is by biting flies or blood contaminated fomites.

Clinical signs

- Per Acute –
- Death within 24 hrs
- Hyper excitation sometimes before death
- Dyspnea
- Icteric mucous memb
- Acute-
- Pyexia
- Pallor to Icteric CMM
- No hemoglobinuria

- In goats similar like cattle
- Hyper excitability and may bite at inanimate objects
- Icteric
- Anemic

- Anaplasmosis in cattle, sheep, and goats is characterized initially by normocytic normochromic anemia, which becomes macrocytic normochromic as the disease develops.

- Immature RBCs in this stage is considered to be a favourable sign 

TREATMENT

- Inj. Oxytetracycline - 22 mg/kg IM or IV for 3 days
- LA can be used

- Imidocarb - 5 mg/kg IM twice, 7 days interval

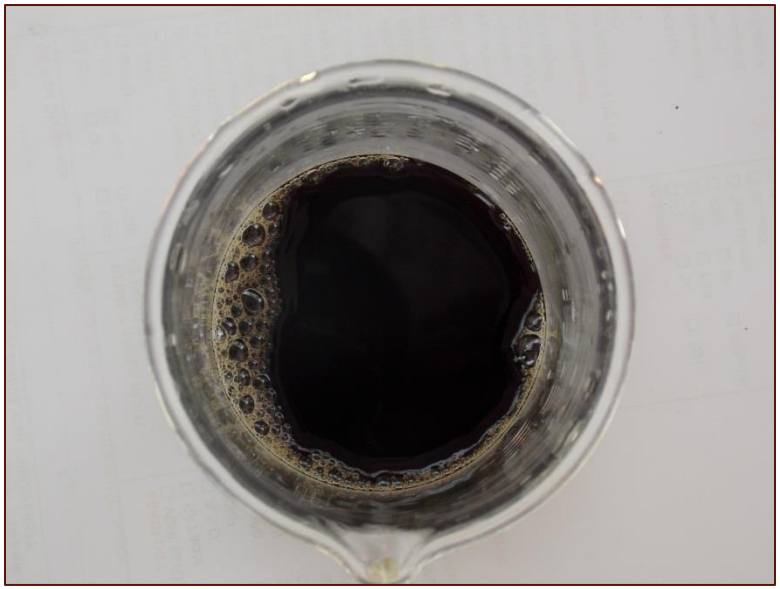
- Inj. Enrofloxacin -12.5 mg/kg SC twice, 48 hrsly

- Administration of **estradiol** cypionate (14.3 mg/kg BW IM) improves the rate of recovery by reducing rickettsemia during treatment.

- **Blood transfusions if** PCV < 15%.

- Rough handling must be avoided

BABESIOSIS



Host affected

- Cattle, sheep, goat, horses, Pig, dog
- Young calves are resistant
- B.bigemina and B.bovis – transmitted transovarially by *Boophilus* or *Rhipicephalus* ticks.
- Tick larvae transmit *B. bovis,*
- Nymphs and adults transmit *B. bigemina*
- *Transovarian transmission in ticks*

CATTLE

- Major small sp – B.bovis (more in visceral)
- Major large sp- B.bigemina (more in pheripheral vessels)
- B.divergens

- **Sheep and goats:** B. motasi, B. ovis
- **Pigs:** B. trautmanni, B. perroncitoi
- Horses : B.cabali and T.equi (previously B.equi)

- Immunity to *B. bovis* and *B. bigemina* last for **4 yrs**.

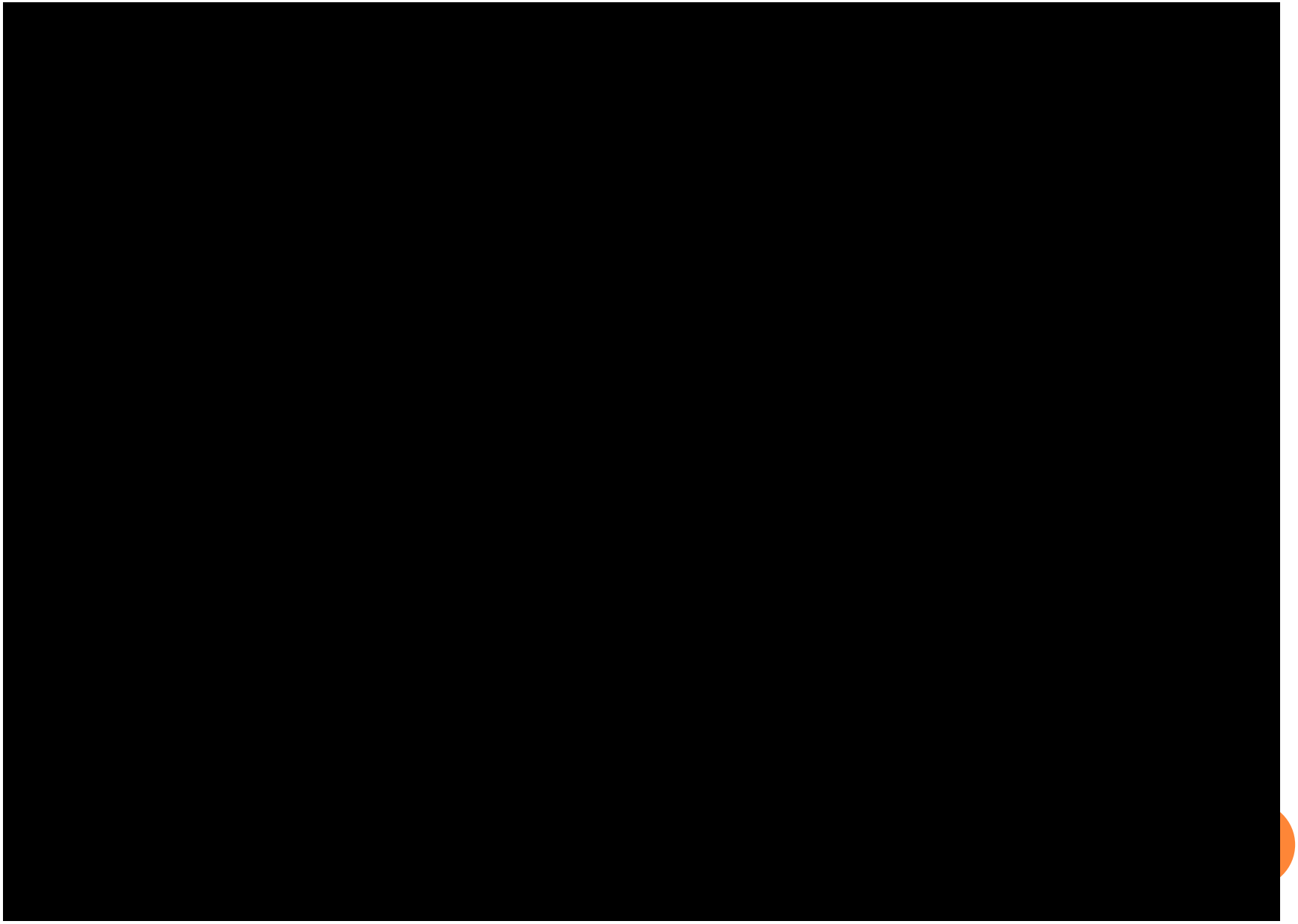
Clinical signs

- B.bovis

- Pyrexia (> 40° C (104° F)
- Hemoglobinuria
- Urine is dark red to brown in colour
- Urine have stable froth.
- Anaemia
- Jaundice

- Diarrhea may occur.
- Muscle wasting, tremors, and recumbency in advanced cases,
- Coma terminally.
- Many severely affected animals die in 24 hours.

- Cerebral babesiosis -- incoordination, posterior paralysis or mania, convulsions, and coma



SUB ACUTE SYNDROME

- *B. divergens*
- In young calves,
- Mild fever
- No hemoglobinuria.
- Spasm of the anal sphincter, causing **“pipe-stem” feces.**

DIAGNOSIS

- Clinical signs
- Peripheral blood smear

  (B.bigemina numerous in pheripheral capillaries., B.bovis in visceral)
- Thick blood smear is preferred
- Blood from Ear tip or tail tip

Necropsy findings

- Splenomegaly
- Gall bladder distension
- Cattle- characteristic severe intravascular clotting.
- Blood smears from pheripheral, liver, heart & brain
- Blood smears within 8 hrs of death
- From brain within 24 hrs Stained with giemsa
- Blood collected after death can also be used for detection of serum antibodies in serologic tests

Differentials

- Theileriosis
- Postparturient hemoglobinuria
- Bacterial hemoglobinuria
- *S*-methyl-L-cysteine-sulfoxide (SMCO).
- Leptospirosis

TREATMENT

- Inj. Diaminazine aceturate (Berenil)
  @ 3.5 mg/kg IM
- **Imidocarb. 1 to 3 mg/kg - SC**
- Blood Transfusion if pcv < 15%

- In all species, treatment regimens for severely
- affected sheep should include blood transfusions
- and antishock preparations. In chronic
- cases and convalescent patients, hematinics
- should be provided

Novel Anti-Babesia under study

- Triclosan
- Nerolidol
- Artesunate
- Epoxomicin
- Gossypol
- Atovaquone

Diseases with hemoglobinuria

- Babesiosis
- Post parturient hemoglobinuria
- Bacillary hemoglobinuria
- Leptospirosis
- Chronic copper poisoning

Clinical management of anemia

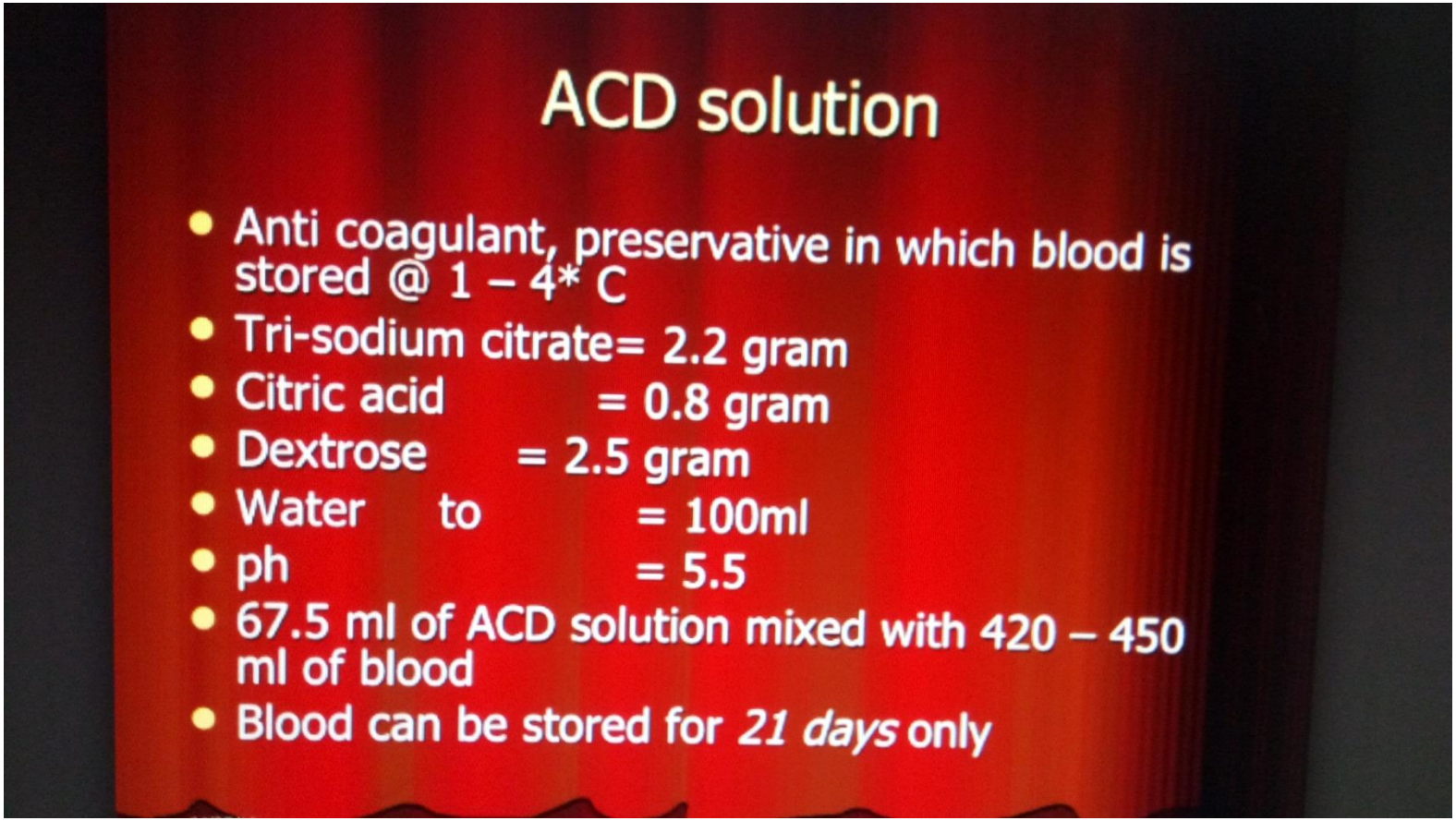
- Blood transfusion
- Pcv > 15 %
- Healthy Donor
- Plama volume expanders


GAS STERILE
BIOSET
BLOOD TRANSFUSION SET
BATCH NO :
MFG. DATE :
M.R.P Rs :
(Inclusive of all Taxes)
EXP.DATE :
WITH SEPARATE AIR WAY
NONTOXIC • PYROGEN – FREE • READY TO USE •
DRUG MFG. LIC. No. 451
MANUFACTURED AND STERILISED BY:
ZENITH
MEDICAL EQUIPMENTS
KALANGAL ROAD, SULUR,
COIMBATORE - 641 402.
INDIA


STERILE • PYROGEN - FREE • NON - TOXIC
HL HAEMOPACK CPDA 350 ml BLOOD BAG
BLOOD BAGS TO BE SOLD TO LICENSED BLOOD BANKS ONLY
Donor Number
Collection Date :
Expiry Date :
ABO Blood Group :
Rh Type :
Serology Non reactive to Test :
Collected & Typed by :
LOT Batch No :
Mfg. Date :
Exp. Date :
Max Retail Price :
(Inclusive of all taxes)
CAUTION
Manufactured by
HLL Lifecare Limited
AKKULAM, SREEKARYAM P.O.
THIRUVANANTHAPURAM - 695 017,
KERALA, INDIA.
CE
0434
EC REP

- Use 1 mL of anticoagulant (CPDA-1/ACD) for every 7 mL of blood

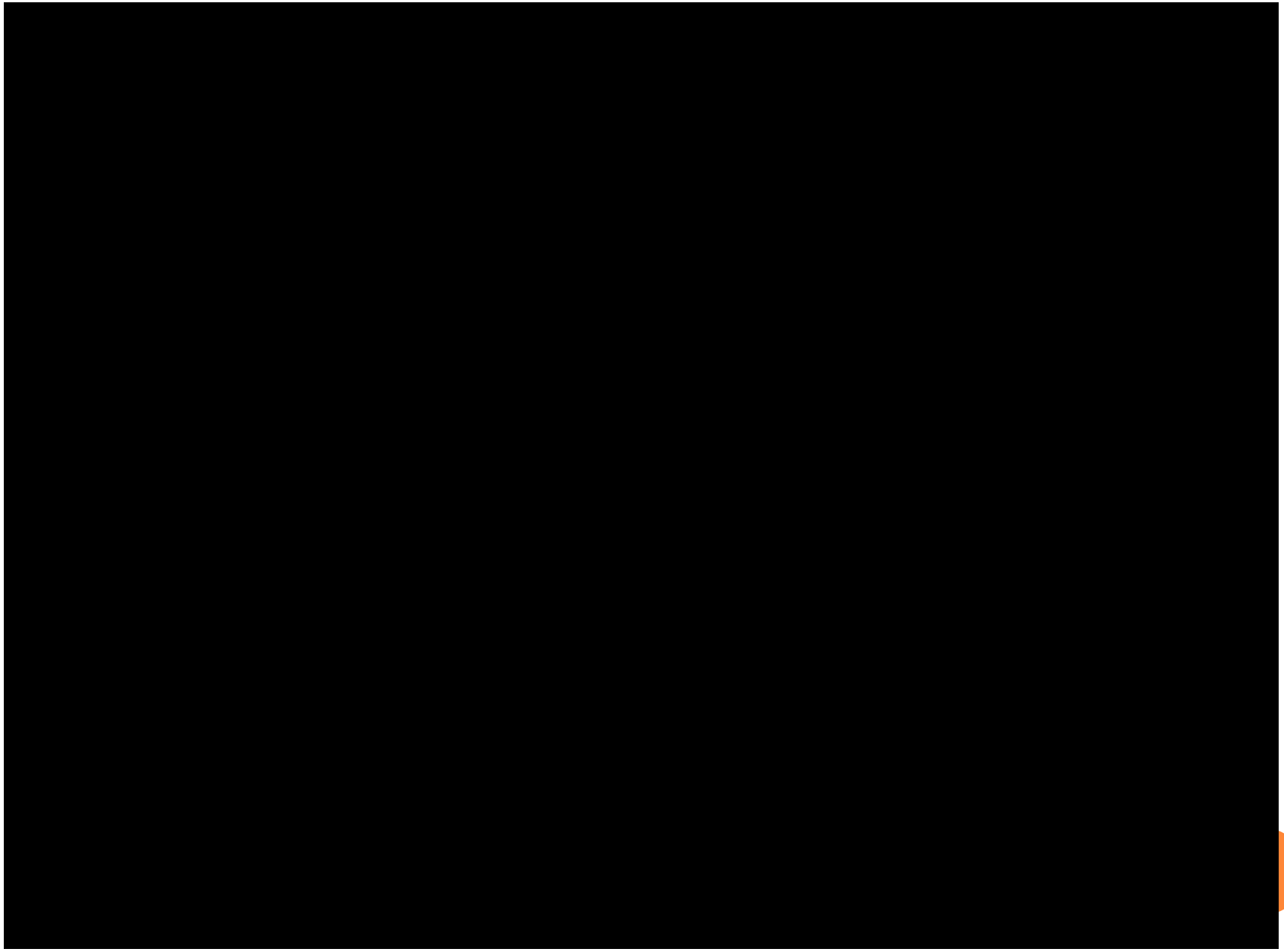
- Heparin - 5 U per mL of blood .

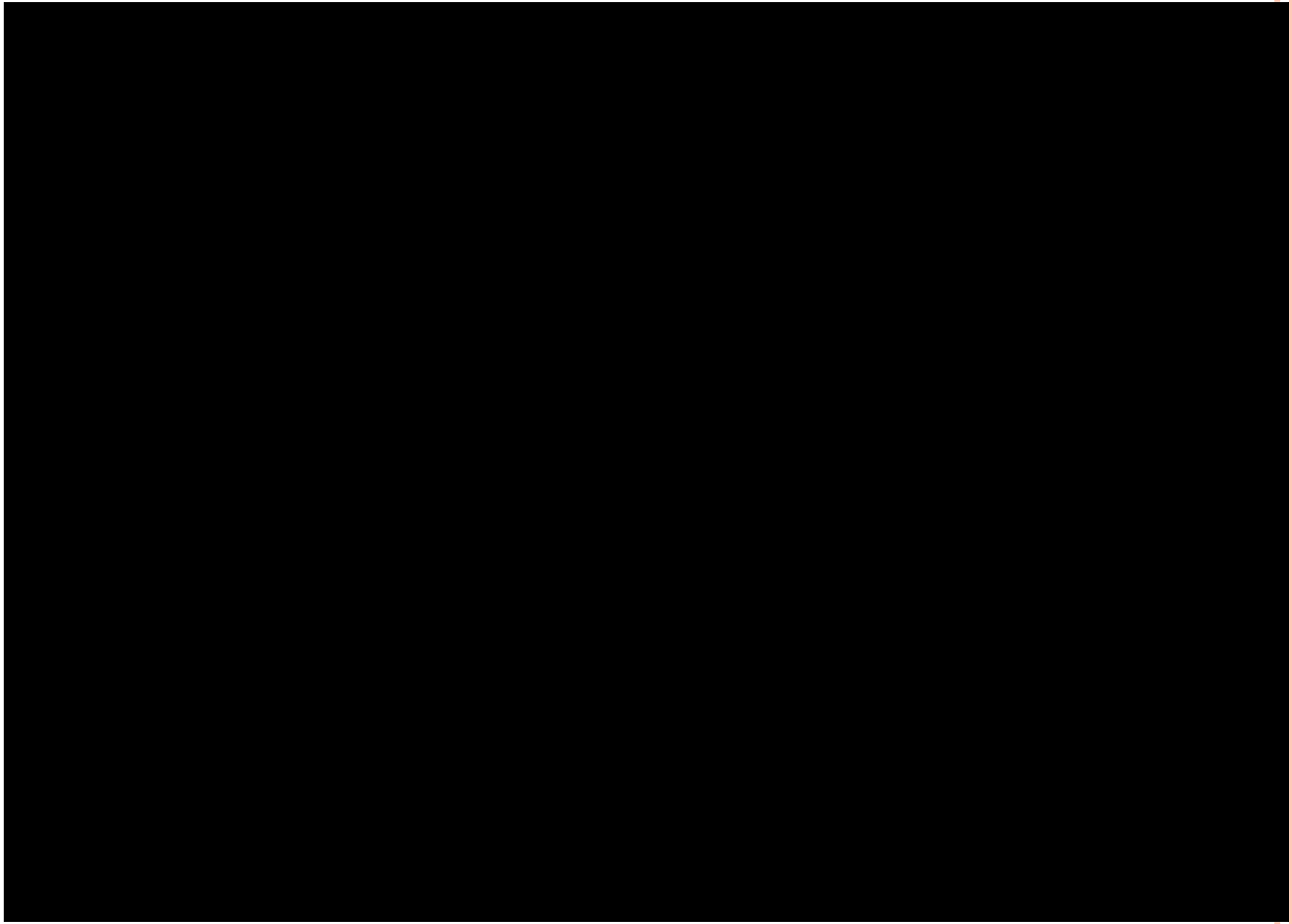

ACD solution
Anti coagulant, preservative in which blood is stored @ 1 – 4* C
Tri-sodium citrate= 2.2 gram
Citric acid = 0.8 gram
Dextrose = 2.5 gram
Water to = 100ml
ph = 5.5
67.5 ml of ACD solution mixed with 420 – 450 ml of blood
Blood can be stored for *21 days* only

If the blood is for immediate use

- Di-sodium Ethylene Diamino Tetra Acetate (Na_2EDTA) @ 100mg in 10ml distilled water/500ml blood.
- Sodium Citrate as 3.8% solution @50ml/500ml blood.
- Heparin as 1% solution @ 50 ml/500ml blood.

Product	Collection	Storage	Component
Fresh Whole Blood	From donar	8 hrs in room temp	RBC,Plateletes, WBC<Clotting factors,Plasma protein
Stored Whole Blood	More than 8 hrs from donar	2-6 c 28-35 days	RBC
Packed RBC		2-6 c 28-35 days	RBC





Watch for Reactions !!!!!!!

- Swelling in Eye lids
- Cough
- Urticaria
- Restlessness
- Tachycardia
- Salivation
- Hemoglobinuria

Trypanasomiasis

- Wet film examination
- Blood smear
- Limb edema?
- Hypoglycemia?
- Nervous signs
- Anemia
- Corneal opacity?

Disease	Tryps sp	Vector
Nagana or African trypanosomosis (most mammals)	*T. brucei brucei* *Glossina* spp. *T. congolense* Other *T. vivax* *T. simiae*	Biting flies
Surra (horses, camels,buffaloes)	*T. evansi*	Biting flies
Nonpathogenic (cattle and sheep)	*T. theileri* *T. melophagium*	Biting flies
Humans Rhodesian sleeping sickness	*T. brucei rhodesiense*	*Glossina* spp.

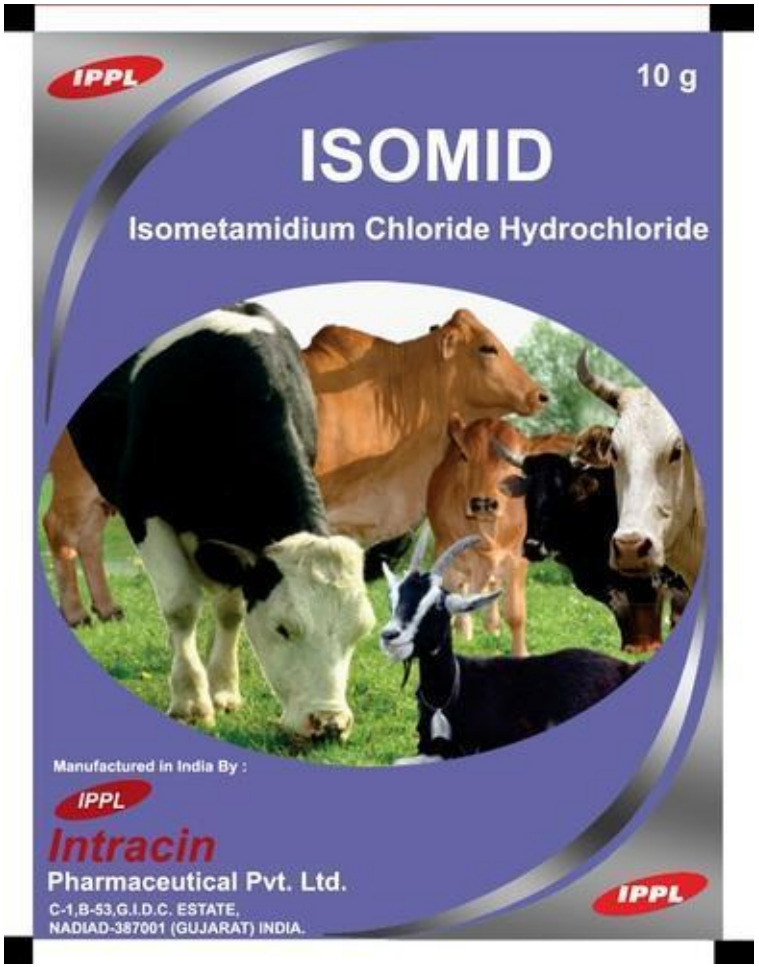
Treatment

- Diminazene aceturate @ 3.5–7 mg/kg IM
- Homidium chloride/bromide @ 1 mg/kg IM
- Isometamedium chloride @ 0.25–1 mg/kg IM for ruminants
- Quinapyramine sulfate (Antrycide) @ 5 mg/kg SC for equines and ruminants
- Suramin (Antrypol) @ 10 mg/kg IV for equines, (camelids, 2–3 times weekly)

ISOMETAMIDIUM

- Preferred drug against ***T. vivax*** **and** ***T. congolense*** in ruminants.

- It is used both as curative and prophylactic drug @ 0.25 to 1 mg/kg IM.



Control

- Isometamedium chloride @ 2 mg/kg IM
- Homidium chloride/bromide @ 1 mg/kg IM
- Prothridium @ 2 mg/kg IM
- Antrycide prosalt @ 7.4 mg/kg SC
- Antrycide/Suramin complex @ 35 mg/kg SC

- For PCR detection, blood or buffy coat is spotted on Whatman filter paper (Whatman No. 4) stored at room temperature and sent to the appropriate laboratory

Trypanasomiasis

- Inj. Berenil IM

- Inj. Quanapyramine Sulphate
- Inj. Quanapyramine Chloride
  2.5gm SC

TREATMENT -SURRA

- T.evansi
- Quinapyramine sulfate – camels

- Diminazene aceturate (Berenil) - Horses.

- Melarsomine hydrochloride IM

  Camels @ 0.25 mg/kg BW

  Cattle @ 0.5 mg/kg BW.

TRYPS
BUFF, CATTLE SMALL RUMINANTS

- Diminazene aceturate @ 3.5–7 mg/kg IM

- Second injection 5 days later 7 mg/kg IM
- If treatment ineffective
- Isometamidium chloride 0.5mg/kg deep IM

- DA treatment is not efficient in the case of nervous infection

- Another alternative is the treatment of horses with quinapyramine sulphate and chloride(curative and chemoprophylacticeffect),which provides durable protection to the animals.

THANK YOU