

CONTAGIOUS BOVINE PLEUROPNEUMONIA: ABATTOIR SURVEILLANCE

(ONLINE TRAINING FOR AFRICA ON 2ND DECEMBER 2025)

TOPIC:

CBPP AETIOLOGY, GEOGRAPHICAL DISTRIBUTION, ECONOMIC
IMPACT, HOST SUSCEPTIBILITY, TRANSMISSION AND CLINICAL
SIGNS

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SHORT INTRODUCTION

- Contagious Bovine Pleuropneumonia (CBPP) is ;-
- an insidious pulmonary disease of cattle, affecting severely health of animals
- characterised by slow diffusion, direct contact transmission, severe fibrinous bronchopneumonia with pleural adherance involvement in the acute and subacute phase and lung sequestra in the chronic phase
- a notifiable disease as categorized by the World Organization for Animal Health (WOAH)

AETIOLOGY

- ❑ CBPP is caused by mycoplasma bacteria, the *Mycoplasma mycoides* subsp *mycoides* small colony type (*MmmSC*).
- Mycoplasmas represent the smallest single cell microorganism capable of multiplying in the absence of living cells.
- They have a simple cell membrane, no cell wall and pleomorphic.
- *Mmm* are easily inactivated by the most common disinfectants with acidic and alkaline pH and heat
- They survive for a short period of time (max up to 2 weeks) in the environment
- These characteristics strongly influence the epidemiology of CBPP

PRINCIPAL MYCOPLASMA PATHOGENS OF ANIMALS

Bovine

M. mycoides subsp. *mycoides*

M. bovis

M. dispar

M. mycoides capri

M. bovine group 7 (M. leachii)

Mycoplasma (Eperythrozoon) wenyonii

Avian

M. gallisepticum

M. synoviae

M. meleagridis

M. iowae

Sheep/goats

M. c. capripneumoniae

M. agalactiae

M. c. capricolum

M. mycoides capri

M. putrefaciens

M. conjunctivae

M. ovipneumoniae

Porcine

M. hyosynoviae

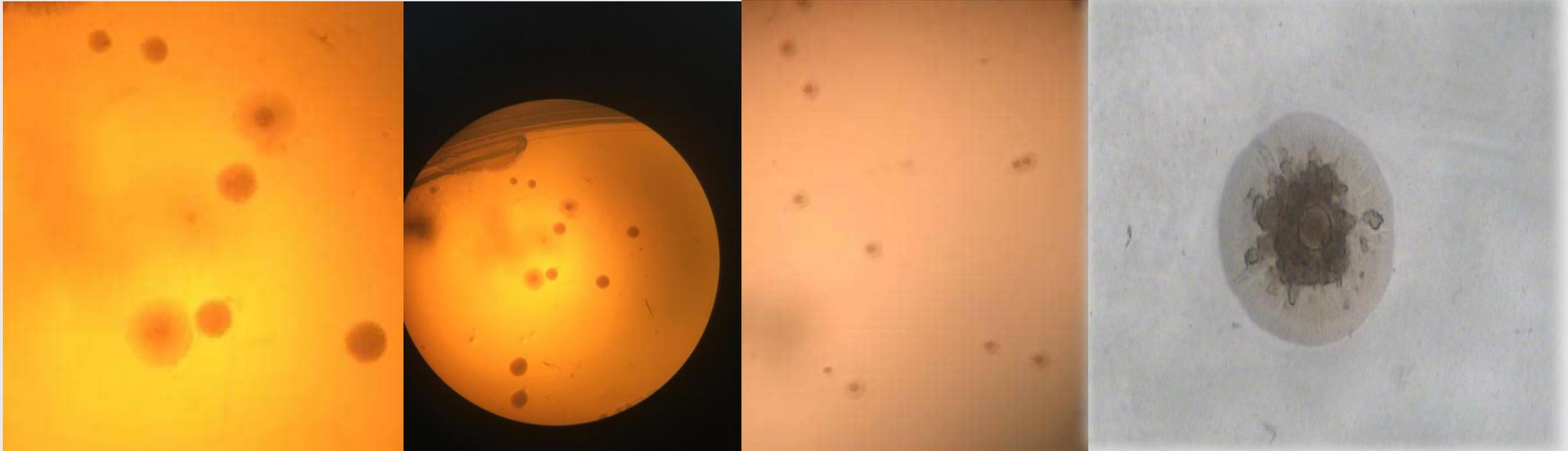
M. hyopneumoniae

Isolation of *Mycoplasma mycoides* subspecies *mycoides*

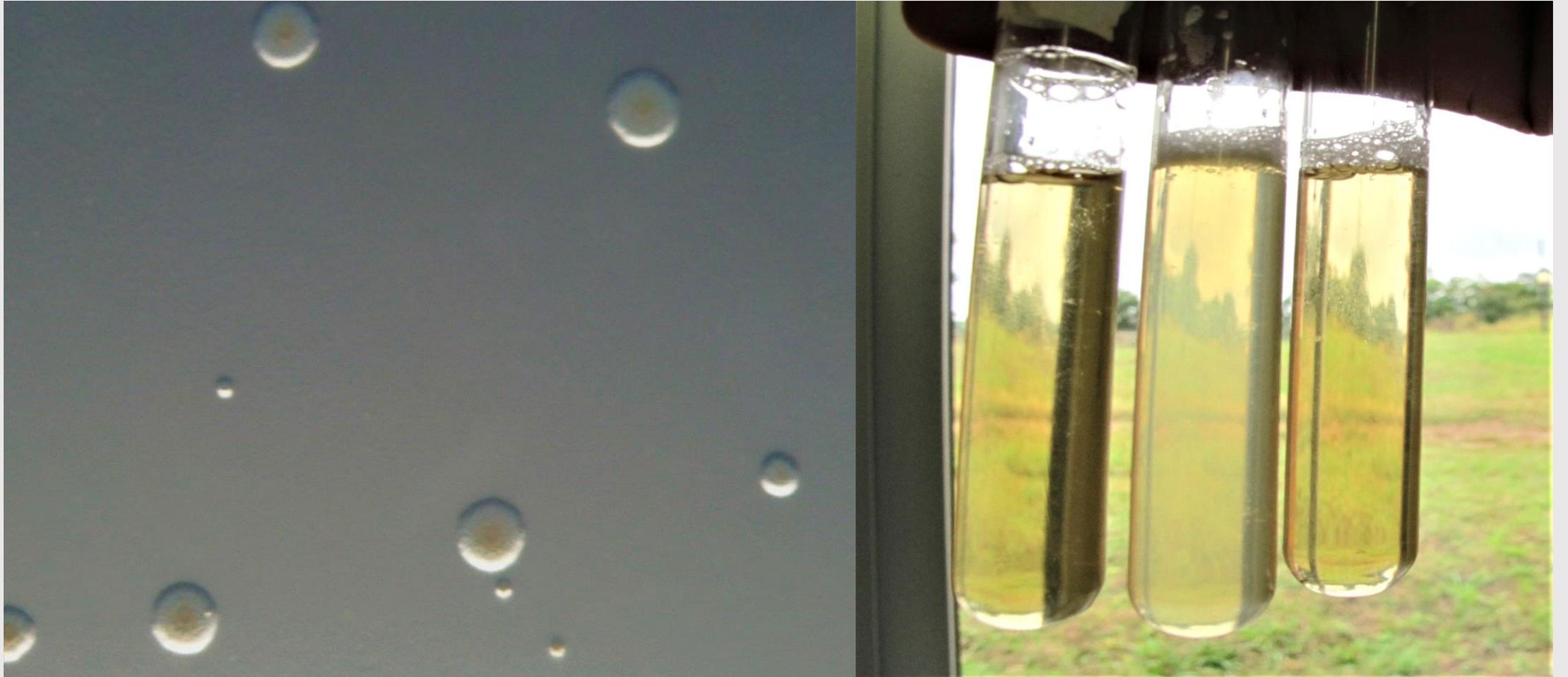
- ❑ Selective culture media with added horse serum, Penicillin G/Ampicillin and Thallium acetate, are used to isolate *Mmm*
- ❑ *Mmm* is able to grow in aerobic and anaerobic conditions, optimal 37 ° C with 5% CO₂
- ❑ Growth can take several days
 - In liquid media, the growth is visible after 3-10 days with a turbidity showing «cloudiness when swirled»
 - In solid media, the *Mmm* colonies are small ($\emptyset < 1$ mm) with a typical «fried egg appearance"

AETIOLOGY...

- ❑ *Mycoplasma mycoides* subspecies *mycoides* small colony type (MmmSC)



Looks of culture media (broth and solid media)



GEOGRAPHICAL DISTRIBUTION

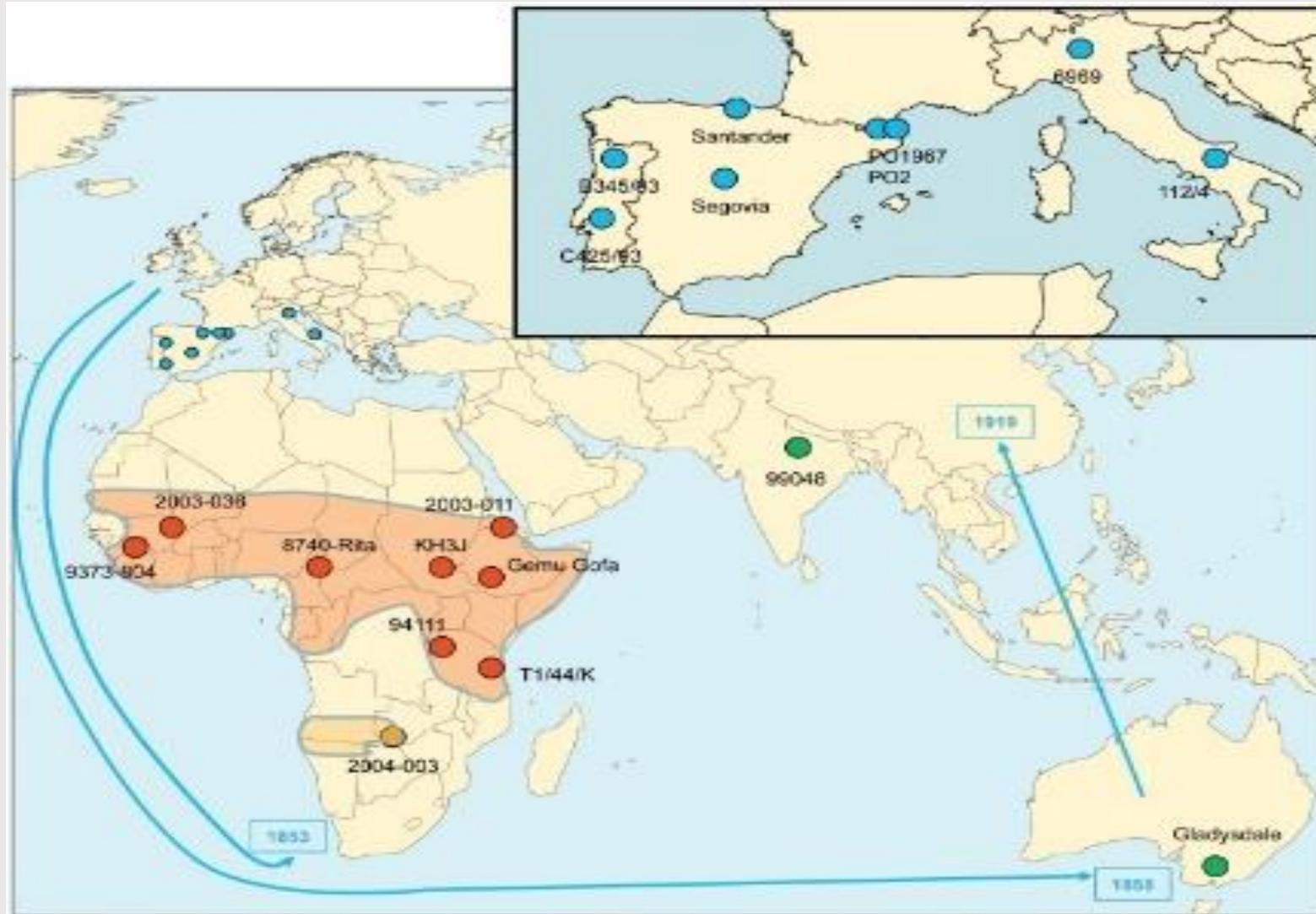
□ Historical Background

- CBPP is considered to be an "ancient" disease
- Perhaps documented for the first time in 1550 by the Italian surgeon Gallo, who called it "Pulmonera"
- Officially described for the first time by de Haller in Switzerland in 1773
- The infectious and contagious nature of the disease was suspected at the end of the 18th century
- Confirmed in 1898 by Nocard and Roux, who first managed to isolate the causative agent

GEOGRAPHICAL DISTRIBUTION (Historical background)...

- For a long time confined to the central-eastern Alps
- During the colonial period CBPP spread all over the world (USA, Australia, Africa, Asia), caused by movement of infected cattle from Europe, with the sole exception of South America and Madagascar
- During the 20th century, the implementation of vaccination and mass culling strategies enabled the eradication of CBPP from most countries
- In Europe, CBPP reappeared in the Iberian Peninsula, probably around 1950

Spread routes during the colonial time



Source: F. Thiaucourt

GEOGRAPHICAL DISTRIBUTION (Historical background)...

- Subsequently, outbreaks occurred from 1984 onwards in some Mediterranean countries, Portugal, France and Spain, until its final eradication in 1999, when the last case was registered in Portugal.
- In Africa, it is believed that CBPP was first introduced through South Africa in 1894 from either Britain or Netherlands through importation of exotic cattle. Thereafter the disease spread to the East Africa and later to the western countries. All this was due to movement of cattle.
- Today, the disease is endemic in many Sub-Saharan Africa countries with serious economic impact. However, America, Australia, Europe, North Africa, India and China are free from the disease.

ECONOMIC IMPACT

- ❑ CBPP is the most economically cattle disease in Africa.
- ❑ The direct losses result from mortality, reduced milk yield, vaccination campaign costs, disease surveillance and research programs.
- ❑ The indirect costs relate to chronic nature of the disease and include loss of weight and working ability, delayed marketing, reduced fertility, losses due to quarantine and consequent reduced cattle trade.
- ❑ It is estimated that the "cost" attributed to mortality, the reduction of livestock production and the control costs of CBPP, in endemic African countries, reaches 70 million euros / year

HOST SUCEPTIBILITY

Animals affected

- ✓ the disease affects domesticated cattle and there is no wild reservoir identified
- ✓ water buffalos are also affected
- ✓ Yak, bison and reindeer are susceptible
- ✓ Humans are not affected

SUSCEPTIBILITY TO INFECTION

- ❑ Adult and older cattle are observed to be more susceptible than calves
- ❑ It is observed that when a disease is introduced in a population there will be a small population which will be resistant or immune to infection
- ❑ breed variations are observed, improved or and diary breeds are more susceptible than the local breeds. They all succumb to disease but generally improved breed will show signs earlier
- ❑ Infection rates usually vary from herd to herd depending on how naive is the herd and control programs instituted in the farm, whether vaccination and treatments are done or not

TRANSMISSION AND SPREAD

□ When we talk of disease transmission

We simply talk of epidemiological term of aspects that enable a disease-causing agent to spread in a population

□ Source of infection

is majorly the clinically infected cattle, but also chronic cases (lungers) play part in perpetuation of infection in the herd

Animals affected



TRANSMISSION OF CBPP AND SPREAD...

□ How transmission occurs

- through direct close contact between clinically affected cattle and susceptible cattle
- infectious agent is present in the nasal discharges and cough droplets from the clinically sick animal
- other body materials with infectious agent include saliva, urine, fetal fluids, contaminated fodder, air transmission in short distances (these are very minor)
- at water points- when susceptible animals drink water with clinically sick animals from the same water source sources
- grazing areas (pasture)/ cattle markets/ bomas (in confinement)- when susceptible animals mix with clinically sick animals and inhale cough droplets from sick animals (this is main way of transmission)

Watering points and confinement areas





Cattle auction markets and grazing areas



SPREAD OF CBPP

- Through movement of cattle from one area/village/district/region/country to another (this makes its transboundary nature) which can be;
 - ✓ pastoralists or nomads moving in search for pasture and water
 - ✓ trekking animals for selling in cattle auction markets
 - ✓ introduction of infected cattle in a herd
- Transmission is not through contact with meat or by eating
- Seasonality may affect the epidemiology but transmission will still occur (dry climate affecting survival of the agent), depends on husbandry practice.
- Movement controls and vaccinations will prevent spread

CLINICAL SIGNS

These are manifestations of the disease in infected animals

Incubation period

- ✓ incubation period varies and generally estimated to occur between 3–8 weeks after exposure. However, this is sometimes more depending on the overall herd immunity

Subclinical disease

- ✓ Some animals don't show clinical manifestation but only you see deaths, this is a fatal disease
- ✓ Some animals are asymptomatic in a herd and after a time partially recover. These can continue to slowly spread infection to other animals.
- ✓ This is seen mostly in disease outbreaks

CLINICAL SIGNS...

Clinical manifestation

- ✓ The principal clinical manifestation is respiratory insufficiency due to pneumonia, hydrothorax and fibrin deposition on pleural surfaces

As the name is, it attacks the lungs and the membranes that line the thoracic cavity (the pleura) causing ;-

- ✓ fever, which may go up to 40.5°C, animals prefer standing in shade
- ✓ respiratory signs such as laboured or rapid respiration, cough and nasal discharges
- ✓ Coughing may be persistent moist or dry
- ✓ anorexia
- ✓ pain during breathing and you see animal stand in position with abducted limbs
- ✓ reluctance to move
- ✓ recumbency
- ✓ Death within few days
- ✓ In stressed situation like exercise, animal may collapse and die

Hydrothorax



Recumbent animal and deaths



CLINICAL SIGNS...

Chronic disease

- ✓ This is a situation which occurs when an infected animal recovers from the disease
- ✓ Some recovered animals may become carriers with chronic lung lesions in the form of sequestra of variable size.
- ✓ carriers may remain infected for a long-time, others estimate up to six months and become source of infection to other animals.

In endemic areas with high prevalence, chronic infection is common, with affected animals showing poor body condition and productivity for a long time, they are called the “lungers”

Morbidity and Mortalities

- Usually, naive susceptible herds contacting the disease for the first time show up higher morbidity more than 50% and higher mortality

THANK YOU FOR YOUR ATTENTION AND LISTENING