

# Regional Training Course on Abattoir Surveillance for Contagious Bovine Pleuropneumonia (CBPP)

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# Contagious Bovine Pleuroneumonia (CBPP)

- Aetiology
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- Transmission
- Epidemiology
- Clinical signs

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# CBPP aetiology

*Mycoplasma mycoides* subsp *mycoides* (Mmm) is one of the mycoplasmas in M. Mycoides cluster, with 5 species

1. Mmm (formerly MmmSC) that causes CBPP,
2. *M. mycoides* subsp *capri* -causes mastitis, arthritis pneumonia, mastitis in small ruminants especially goats)
3. *M. capricolum capripneumoniae* (Mccp) –CCPP -pneumonia only
4. *M. Capricolum capricolum* (Mcc) causes mastitis, arthritis and pneumonia
5. *M. Leahii* causes mastitis, arthritis and infertility in cattle (Bovine serogroup 7)





# CBPP aetiology.....

- Causative agents identified and classified originally by serology but currently by genomics methods that include PCR and sequencing
- Serology in cattle: CFT and c-ELISA, Related to diagnosis
- Serology in goats: c-ELISA and CFT
  - MaKePS syndrome (mastitis, Keratitis, Pneumonia and Septicemia)
  - Clinical signs



# Geographical distribution of CBPP

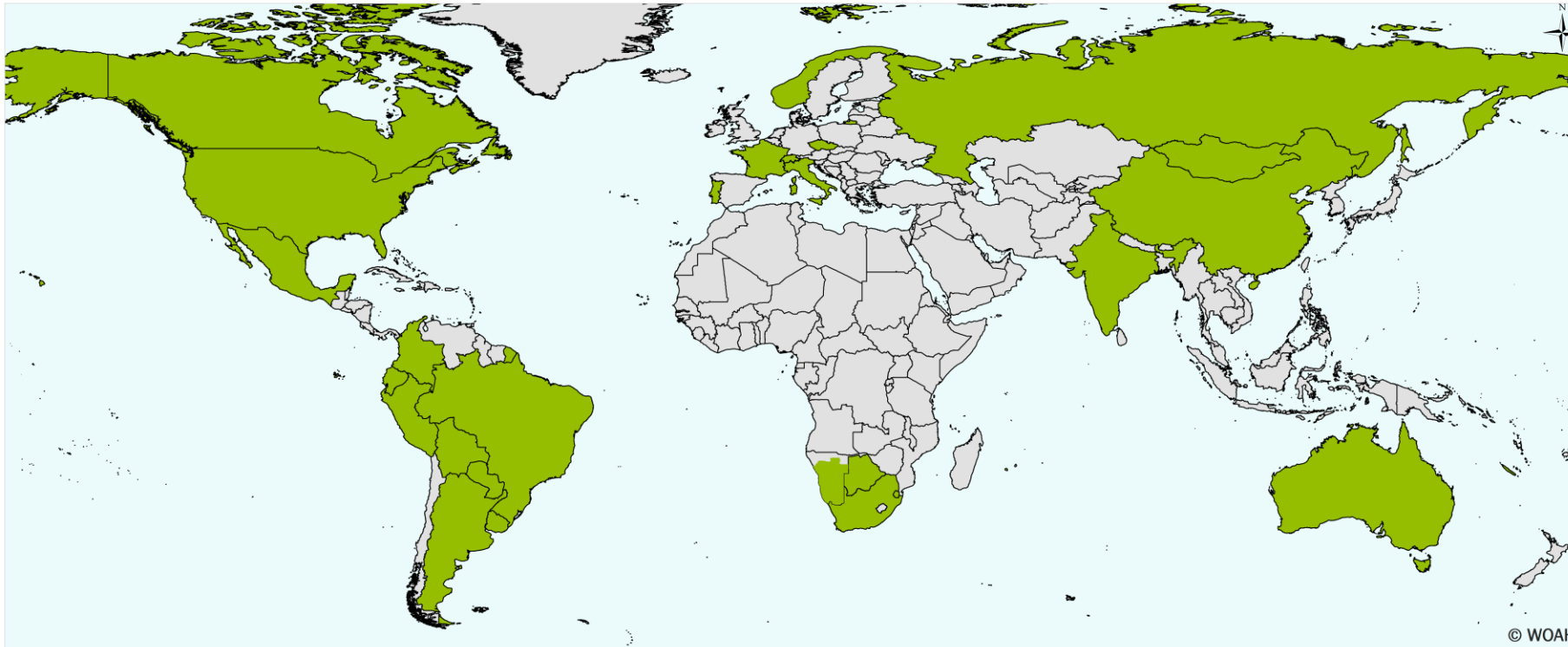
CBPP reported present in 18 countries in Africa



Within a country, distribution dependent on cattle movements according to categorization as:

- 1) Pastoral grazing
- 2) Agro-pastoral- mixed farming, rainfall deficient
- 3) Intensive farming- mixed rainfall sufficient production

## WOAH Members' official CBPP status map

Last update June 2025



-  Members and zone recognised as free from CBPP
-  Countries and zone without an official status for CBPP



## Geographic distribution...

- Highly endemic in pastoral herds in Sub Sahara Africa
  - from East to West Africa (Nigeria, Uganda, Tanzania)
  - Fewer countries in Southern Africa (Zambia, Angola & Northern Namibia)
- Sporadic outbreaks and pockets of endemicity in Asia (parts of India, Bangladesh and Myanmar)
- Occasional outbreaks in Middle East associated with cattle importation from Africa





WOAH-WAHIS composite map (2005 – 2019) of the distribution of CBPP in Africa (red = present; yellow = suspected). Map generated on 5 April 2022.



## Economic impact

- The most comprehensive study using a spreadsheet economic model (Tambi et al, 2007) with data from 12 countries in Africa reported
  - a total economic cost (direct and indirect production losses plus disease control costs) of 44.8 million euros (3.7 million euros per country).
  - An investment of 14.7 million euros to control CBPP would prevent a loss of 30 million euros.
  - The financial return on investment in CBPP control is positive, with benefit-cost ratios that range from 1.61 (Ghana) to 2.56 (Kenya).
- Data not reflective current disease status.
- Studies on-going at ILRI, to estimate the contribution of CBPP on milk losses on the total economic cost. Preliminary data shows up to 30x more losses due to CBPP



## Host susceptibility

CBPP affects genus Bovidae, both *Bos indicus* and *Bos taurus* species.

Also affects Asian Buffalo (*Bubalus bubalis*), Yak (*Poephagus grunniens*), and Bison (*Bison bison*).

- Small East African zebu observed to be more susceptible than Improved zebu-Boran under experimental conditions
- There is no agreement on age susceptibility
- Young cattle (<12 months) develop joint swellings rather than lung infection
  - Some studies observed that younger animals below 24 months are more susceptible while others suggest the older ones. Personal observation favors older animals 24 to 48 months as more susceptible
  - Sheep, goats and African Buffalo: not important in epidemiology of CBPP





# Transmission

- Cattle to cattle and no reports from any other species
- Initial speculation was CBPP live attenuated vaccines were capable of transmission- not confirmed
- Close contact, especially at watering points and bulls more prone because of the tendency to fight on meeting: Distance of 50 metres considered safe
- Animal health during drought seasons result in malnutrition, susceptible immunity
- Mass migration and interaction in areas where pasture and water resources are available
- Natural vs experimental transmission: Variation in disease presentation –  
Animal model is he host intubation/nebulizer





# Epidemiology

- Whereas the disease can last up to 6 months in a herd,
- Mass migration to grazing fields away from home takes place every 3 months, allowing random mixing of new herds with previously infected herds with carriers
- This allows maintenance of the disease in endemic areas
- Animals in previously affected herds in endemic areas suffer less severe clinical signs and therefore difficult to detect
- Susceptible herds (in newly infected herds and with no history of the disease) even in endemic areas suffer more severe clinical disease
- Vaccination contributes to less disease in a herd but currently, it is not known how much this affects spread of the disease
- Field diagnostics to support disease surveillance lacking





# Clinical signs

- Clinical signs are classified into hyperacute, acute, subacute and chronic forms.
- One herd can have all the forms at once, often with only 10% of the herd showing disease at any one time.
- The disease can last up to 6 months in a herd if intervention is without vaccine
- Hyperacute form is associated with sudden death, which under field conditions is difficult to identify but under experimental conditions it is preceded by fever  $>40^{\circ}\text{C}$  and above for 2- 3 days, with tearing
- Acute form is associated with respiratory symptoms which without intervention, may last up to 5-7 days





# Clinical signs.....

- fast, difficult or noisy breathing, discharges from the nose and coughing
- Farmers complain of disturbing form of persistent cough which at night is considered as noise from cough and loud sounds of breathing. Intervention with antibiotics (especially tetracyclines) is said to prolong the life of the animal but eventually dies
- Calves (up to 18 months) show arthritis instead of signs of pneumonia
- Milking cows drop milk production for several months and some dry up, never do not recover to previous production levels
- Abortions are reported
- Chronic form is associated with loss of appetite and weight





# References

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- Economic impact
  - Tambi et al., 2007
- 2. Geographic Distribution-
  - WOAHA Standing Group of Experts on Contagious bovine pleuropneumonia for Africa (amended on 13 March 2025)
  - Food & Agriculture Organization:  
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