Caprine Arthritis & Encephalitis (CAE)

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What is CAE?

- Disease of goats caused by the caprine arthritis encephalitis virus (CAEV)

- Lentivirus – Retroviridae family
CAE is more common in dairy than meat goats
What are some of the clinical signs of CAE in a herd? (mature goats vs kids)

- Arthritis, pneumonia, mastitis, weight loss (in mature goats)
- Encephalitis (more common in kids).
What are some of the clinical signs of CAE in a herd? (mature goats vs kids)

- Most infected animal in will be asymptomatic (sub-clinical)
- CAE decreases the lifetime productivity of dairy goats
Course of the disease

- Early infection of kids (via colostrum)
- Months or years for disease to develop
- Only about 20% of infected goats will show clinical signs
Main symptoms in adult goats

- Sudden or progressive lameness due to poly-synovitis arthritis in older animals
- Enlarged knee or carpal joints (big knee)
- Loss of body condition
- Rough hair coat
- Pneumonia with laboured breathing
- Indurative mastitis (hard udder)
- Reduction in milk production or agalactia
Main symptoms in kids (2-4 months old)

Encephalomyelitis

- Lameness
- Depression
- Weakness
- Head twitch + heat tilt
- Muscle tremors
- Wobbly gait (ataxia)
- Paralysis
- Circling
What lesions are seen at post mortem?

- Thickening of joint capsules
- Proliferation of synovial villi
- Soft tissue calcification (tendon sheath, bursa)
- Cartilage destruction
- Rupture of ligaments and tendons
- Inflammatory cell infiltration of spinal nerves
What lesions are seen at post mortem?

- Grey-pink small foci in lungs
- Interstitial pneumonia
- Enlarged bronchial lymph nodes
- Mononuclear infiltration of mammary tissue
Can goat get rid of the virus?

- No. Once infected – always infected.
- Persistent infection is typical of retroviruses.
Where is the virus present?

- The virus is known to be present in:
  - The USA,
  - Canada,
  - NZ,
  - France,
  - Switzerland

>60% seroprevalence in these countries
Where is the virus present?

- Some Caribbean countries such as Barbados and Jamaica have apparently eradicated the virus by culling entire imported herds.

- Other Caribbean countries have it at very low prevalence and live with it.

- The virus is rare in indigenous goat breeds in developing countries.
Are some breed of goats more susceptible than others?

- Yes the evidence suggests that creole breeds are more resistant to the virus.

- In some countries native goats have shown increased resistance to the virus compared to other breeds such as imported Saanen.
What is the primary route of infection?

- Virus infected colostrum or milk from infected does to kids

- This is the most efficient transmission route.
Are there other routes of infection?

- *Unlikely methods of transmission are:*
  - *In utero* transmission
  - Birthing transmission
  - Transmission via saliva
  - Transmission via respiratory secretions during mothering
  - AI
  - ET
Within herds there may be a low level of horizontal transmission from:

- Milking parlour equipment
- Contaminated equipment
- Fomites
Can the virus be transmitted in semen?

- Yes, semen can be contaminated with the virus: This was shown in experimental infection - but is probably a rare event under normal situation.
What role does live animal trade play in transmission?

- *Many countries detected the virus for the first time after live goat imports*

- *Live animal trade is therefore a major risk factor*

- Hence testing for CAE or confirmation of CAE freedom is usually required by importing countries
How is the disease diagnosed?

• History

• Clinical signs

• Laboratory tests
Lab tests

✓ AGID (be aware that colostral antibodies in young kids will cause + result)

✓ ELISA (very low titres may not be detectable)

✓ Western Blot

✓ PCR

✓ Virus isolation
Differential diagnoses

- Arthritis caused by mycoplasma etc
- Traumatic arthritis
- Other causes of paresis and ataxia (spinal cord abscess, enzootic ataxia, trauma, congenital defects)
- Listeriosis (in case of CNS signs)
- Rabies (in case of CNS signs)
Can the virus be transmitted to other species?

- To date the disease has not been detected in other livestock species
- However, it is felt that the virus can infect sheep.
- Experimental infection in sheep is possible
Are there CAE control and eradication programmes in some countries?

- Yes.

- There are such programmes in the USA, NZ, Norway and other countries

- In a few Caribbean countries entire infected herds have been culled to eradicate the virus. (Imported animals in 2 cases)
Recommended control measures

• *Snatching of kids at birth and their permanent isolation from infected does

• *Feeding of colostrum heated to 45°C for 60 minutes.

• Feeding of pasteurized milk
Other recommended control measures

- Semiannual testing of herd to isolate and segregate – vs + animals (at least 6 feet separation of pens)

- Culling of sero+ animals (retrovirus)
Are there currently vaccines against the CAE virus?

*NO – not yet!
Can humans get the disease?

- No. The virus has never been found in people. The known retroviruses seem to be species specific, for example:
  - CAE in Goats
  - Maedi Visna in Sheep
  - Bovine leucosis (Cattle)
  - Avian leucosis (Poultry)
  - Equine infectious anemia (Horses)
  - AIDS in people
Thank you!