Control of Pestivirus Infections in Cattle

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Bovine Pestivirus - BVDV

- First recognised in 1948 in USA
- Bovine Viral Diarrhoea Virus (BVDV)
- Mucosal Disease Virus
- Classical Swine Fever
- Border Disease
BVDV – What does it do?

Breeding and cattle

- Reduced conception rates
- Embryo and foetal deaths – reduced pregnancy rates
- Abortions
- Birth defects
- Stillbirths, weak calves
- Persistently infected (PI) progeny
Infection between days 90-180 of gestation
BVDV – What does it do?

Growing and mature cattle

- Suppresses immune system
- Increased chances of infection with other viruses and bacteria
- Respiratory disease in intensively managed cattle – especially feedlots
Persistently infected cattle

- Outcome of infection at 30-90 days of gestation
- Surviving calves small and usually grow poorly
- Weaner ill-thrift
- Deaths in weaners and yearlings
- Indicate spread of virus in herd >9 mths ago
Persistently infected calves
Persistently Infected Animals

- Carry virus for life
- Shed large amounts of virus continuously
- Few produce antibodies to the virus
- Reservoir of virus in nature
How is the virus spread?

- Virus is readily spread following close contact between a PI and a susceptible animal or contaminated environment.
- High rates of transmission with high stocking density/handling – can be 60% in 24 hours.
- Entry into a herd can be subtle – a pregnant female is exposed and foetus becomes a PI (cannot detect by testing dam) (including shows, sales).
- No evidence of entry to herd until delivery of calf.
- Can be ‘over the fence’ as initial point source.
How is the virus spread?

- "Carrier" (PI) animals excrete virus in:
  - aerosols
  - discharges: nasal, ocular, uterine
  - urine
  - faeces
  - milk
  - semen
Incidence of persistently infected calves

- Adult population - commonly 1%

- New-born to yearling - extremely variable - can be very high (50%) in a problem herd
Incidence of BVDV infection

- About 90% of herds have some immune animals
- 70% of herds have evidence of active or recent infection
- Once the PI animal(s) die, quickly develop a susceptible herd
- Can be fully susceptible mobs within an infected herd
- Good management can create a problem (segregation)
- Infection during agistment (eg drought)
What is the economic impact?

- Some herds suffer no loss in the short term

- Chronic low level losses (1-2% p.a.) may cost Qld herd up to $35M/year; indirect losses of $100M to state
What is the economic impact?

- Herds with an outbreak
  - many susceptible animals after PI deaths/culling
  - Losses can be very high (up to 50% of calves)
- Losses estimated at $100,000 in outbreak year
- Takes up to 8 years to recover
Why control BVDV

- Major problems often initiated by 1-2 PI animals
- Can be inadvertent/disguised entry (eg pregnant cow) that leads to high level losses
- PI animals have reduced life expectancy, reduced productivity if they survive – not “fit for purpose” – defective when sold & worthless
- Potential liability for vendor
Control options

- Control movement of PI animals?
- Removal of PI animals (combined with other control measures)
- Maximise mixing of breeders (>30 days before joining)
- Screen ET donors & bulls
- Vaccination of breeders
- Do nothing and expect a crash once every 8-10 years
Detection of PI animals

- Accurate, quick inexpensive test (PACE)
- Once in a lifetime
- Range of sample types for live animals
  - Blood or serum
  - Skin samples – ‘ear notch’
  - [Hair samples]
Recommendations

- Adoption of BVDV control measures in stud and seed-stock producing herds (good test and vaccine)
- Encourage testing of replacement breeding animals prior to sale
- Testing of stud animals as a component of registration
- Agricultural shows only include animals shown to be free of persistent infection with BVDV. [If stud animals tested for registration, further testing would not be required].
- Testing of donors and recipient animals in embryo transfer programs where the progeny are likely to be sold.