Theileria in cattle- a farmers guide to a “new” disease

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Cattle Health Coordinator
What are Theileria?

- Theileria are protozoa
- Microscopic
- Other examples include:
  - Malaria (People)
  - Coccidiosis (Animals and birds esp poultry)
  - Tick fever (cattle)
What diseases do Theileria cause in cattle?

- *Theileria parva*  East coast fever
- *Theileria annulata*  Tropical theileriosis
- *Theileria sergenti/T. buffeli/T. orientalis* complex

  Bovine anaemia cased by *Theileria orientalis*- theileriosis
Distribution of major Theileria species of cattle

- Courtesy Matt Playford
Bovine theileriosis in Australia

- First recorded 1910
- Incidental finding, common Qld and nth NSW
- 2006 in NSW sickness and deaths
- Anaemia main feature of the disease
- March 2009- District Veterinarians Conference, Pt Macquarie
- September 2009 Theileria Workshop
  - Name of disease- benign bovine theileriosis
  - Case definition
  - Research Priorities
  - Theileria working group
How would I recognise the disease?

- Lethargy
- Lack of appetite
- Exercise intolerance
- Gums pale and/or yellow
- Abortion and still births
- Deaths—particularly late pregnancy or early lactation
How would I recognise the disease?

- Photos courtesy Ian Poe
How would I recognise the disease?

- Photos courtesy Ian Poe
How would I recognise the disease?

- Photos courtesy Bruce Watt
How is the disease diagnosed?

- History
- Clinical signs
- Laboratory examination of blood
  - Anaemia
  - Theileria parasites
- Other common causes of regenerative anaemia excluded
Theileriosis - a tick born disease

Animal 1
Piroplasm in red blood cell

Animal 2
Piroplasm in red blood cells

Tick

Animal 2
Schizonts in White blood cells

Lice
March Flies
Blood?

Australian

Exotic
Ticks and theileriosis in Australia

- Bush tick - likely to be the main culprit
- Others:
  - Wallaby tick
  - Bandicoot Tick
  - NOT the Cattle Tick
- Transmission - small numbers required
- Detect in blood shortly after exposure
Tick distribution
Bush Tick life cycle

**Cow 1**
- Egg → Larvae
  - Hatch in Summer
- Larvae feed for up to 1 week
  - Microscopic → Pinhead

**Cow 2**
- Larvae → Nymph
  - Late summer to early winter
- Nymph feed for up to 1 week
  - Pinhead → Matchhead

**Cow 3**
- Matchhead → Pea size
- Female drops off and lays up to 3000 eggs

**Nymph**
- Adult
  - Mainly spring
## Mechanism of spread

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<th>Ticks observed in the 2 years prior to disease diagnosis</th>
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<td></td>
<td>Yes</td>
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<tr>
<td>Coastal</td>
<td>36</td>
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<tr>
<td>Non Coastal</td>
<td>4</td>
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<td>Total</td>
<td>40</td>
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Why is the disease more serious today than before 2006?

- PCR test allows variants to be distinguished
- Prior 2006 - buffeli and probably chitose were present
- 2006 Ikeda first detected
- Ikeda
  - Ikeda MPSP always detected on properties with disease
  - Ikeda MPSP always detected in severely anaemic animals - as pure or mixed
Where are farmers seeing disease?
Where are farmers seeing disease?
How might the parasite be introduced to my farm?

- Animal movements
- Patterns of disease
  - Introduced adult cattle
  - Home adult cattle
  - Calves
What can I do to reduce the chances of introducing the parasite?

- Don’t introduce cattle
- If cattle introduced:
  - Introduce from districts where infection is uncommon
  - Biosecurity on introduction
    - Treat for ticks on arrival
    - Place in paddocks less favourable for ticks
    - Don’t mix with home cattle
What can I do to reduce severity of disease?

- General management
- Observation of at risk cattle
- Early veterinary attention
- Future
  - Drug limited infection?
  - Vaccination?
What drugs have been used to treat cattle with theileriosis?

- Hydroxynapthoquinones (paravquone and buparvaquone)
- 8-amino quinoline derivatives (primaquine and pamaquine)
- Quinazolinones (halofuginone lactate)
- Antibiotics- tetracycline
- Carbanilide derivatives (immidocarb)
<table>
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<th>Property 1</th>
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<tr>
<th>Farm 2</th>
<th>Farm 1-Trader</th>
<th>Farm 3</th>
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<tr>
<td>Uninvestigated deaths in December 2010</td>
<td>August 2010 Coastal steers November 2010 - 140 Cows and Calves ex WA</td>
<td>Uninvestigated deaths in December 2010 March 2011 - Ikeda detected</td>
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<tr>
<td>March 2011 - Ikeda detected</td>
<td>December 2010 - sickness and deaths in WA cows</td>
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- Across the fence transmission
- Ticks?
Property 2

- Home property Coonamble
- Coastal block at Gloucester- had for approx. 20 yrs
- 16/4/2010 52 PTIC Cows moved
- 1/6/2010 Theileriosis diagnosed
- Losses- 4 cows died, 30 abortions
- Estimated cost-$26 500
- Plan to cease moving cattle
What precautions should be taken in the future?

- Cattle have had disease/high probability Theileria on farm?
  - Don’t get rid of cattle
  - Introduction naïve cattle a risk
  - My cattle might spread elsewhere

- Cattle naïve
  - Don’t introduce cattle
  - Introduce cattle from districts where Theileria uncommon
  - Biosecurity on introduction
  - Moving cattle?
General Biosecurity advice

- When buying cattle, always request a Cattle Health Statement
- See http://www.farmbiosecurity.com.au
More information

- Primefact: Bovine anaemia caused by Theileria orientalis group
Cost- Overall

- Dairy
  - Average $58,916
  - Range $5,300-204,000

- Beef
  - Average $11,662
  - Range $300-100,000
Cost- per head

- Dairy
  - Average ($/head) $131
- Beef
  - Average ($/head) $67