Investigations into novel pathogens associated with bovine reproductive failure

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Bovine Reproductive failure

• Economics
  • Poor reproductive performance across a herd costs estimated €231 per lactating cow in lost production¹
  • A single abortion in a dairy herd estimated £630²

• GHG emissions
  • Feeding and maintaining less productive livestock
  • Reproductive problems one of the major reasons for culling dairy cattle in the US and Europe
    • ↑7.5% increase in g CO₂ equivalents/litre milk -- 20 to 30% replacement rate³

¹ Inchaisari et al, 2010. Theriology 74, 835-846
Emerging cattle chlamydial infections

- Wheelhouse et al. 2010. *Chlamydia*-like organisms in UK bovine abortions
- Deuchande et al. 2010. Case study; *Parachlamydia* observed in abortions
- Blumer et al. 2011. *Parachlamydia* and *Chlamydia* in Bovine abortions in Switzerland
- Wheelhouse et al. 2014. *Chlamydia* and *Parachlamydia* in Irish bovine abortions (20%)
- Aduriz et al. 2015. *Parachlamydia* in a case of bovine abortion in Spain
- Wheelhouse et al. 2015. *Parachlamydia* in bovine abortions in England and Wales (10%)
• ‘Emerging Chlamydia-like organisms as novel causes of bovine reproductive failure’
  • David Longbottom, Mark Dagleish, Nick Wheelhouse
  • Javier Guitian, Dirk Pfeiffer (Barbara Wieland)
• Environmental route of transmission
• Association – causal role??
• Isolation & pathogenesis studies
• Generation of antibody reagents
• Prevalence studies in UK
• Epidemiological studies across the UK dairy industry
Cross-sectional study

- Neospora caninum
- IBR
- BVD
- Leptospira
- Salmonella sp.
- Coxiella burnetii

- BVDv
- Chlamydia sp.
- Coxiella burnetii

Data obtained from questionnaires and production records

Bulk milk
260 farms
Longitudinal study

20 farms recruited with/without reproductive performance issues (20-30 animals/farm)

12 months

Screened for exposure to common abortifacient agents
Where are we?

Prevalence

- *Chlamydia*-like organisms have been identified in cattle abortions:
  - England & Wales, Ireland, Spain

- However prevalence possibly greater in beef cattle!
Where are we?

Cross-sectional study

- Lab analysis is completed
  - Individual farmers have been contacted
- Data analysis is yet to be completed
  - Regional differences?
  - Impacts of pathogens upon productivity to be assessed (Effects upon GHG emissions!)

Longitudinal study

- Farms recruited March/ April
- Sampling is underway (>200 serum samples to date)
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