

## A study of Pestivirus in eastern Australia:

Farmers' understanding of the  
disease and its control



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<http://esvv.eu/?page=meetings&id=37>



# What do we know about Bovine Pestivirus?

- Bovine Pestivirus = Bovine Viral Diarrhoea virus
- Occurs worldwide
- Classical Swine Fever & Border disease in same virus family
- Clinical manifestations described in 1946 in USA (Olafson et al), but around long before then (e.g. 1483)

# What do we know about BVDV/Pestivirus?

- Two genetically separate groups: Type 1 & Type 2 (diverged around 1743 in North America)
- Type 1 separated into sub-groups 1a-1k
- In Aus. predominantly Type 1c, with some 1a

# Impact of infection with BVDV Type 1c/1a

- Naive mature animal: Transient infection (TI)  Immune
- Naive Pregnant Dam: poor fertility - breeding period  
embryonic death and abortion  
development of PI calf (1<sup>st</sup> trimester)  
foetal deformities (2<sup>nd</sup> trimester)  
neonatal deaths/weakly calves
- PI calf & TI individuals: immunosuppression
- PI calf: noncytopathic biotype  cytopathic = Mucosal disease biotype

# BVDV in Australia

- 80-90% of herds exposed
- 30-40% of cattle exposed
- 0.5-1 % prevalence of PI animals
- Vaccine (Pestigard®, Zoetis) available since 2003
- Prior to vaccine launch, some protection achieved by deliberate exposure of immunologically naive herd-mates to a PI animal

# BVDV in Australia

Meat & Livestock Australia (MLA) report 2006  
(Sackett et al) concluded....

- - data on prevalence was incomplete
- - impact of the disease could not be validated
- - difficulties quantifying cost-effectiveness of vaccination

# Survey

- 1500 eastern Australian cattle producers, with double mail-out
- Desired sample-size of 400, with a 25-30% response
- 95% confidence interval, assuming 50% conduct any single practice
- Commercial mailing database: 76 Qld, 951 NSW, 473 Vic



# Results: Initial outcomes from 1<sup>st</sup> mailing

- 108 responses (Qld 5, NSW 67, Vic 36)
- 26 respondents (24%) in dairying, remainder beef
- Breeding-cow herd size ranged 50-1950 cows
- Herd dynamics
  - 'closed herds' - 38%
  - 'occasional introductions' - 50%
  - 'regular introductions' - 12%

# Results: Understanding about BVDV

Table 1: Percentage of respondents (n=92) which identified each of the listed outcomes as possible consequences from a BVDV infection in a susceptible animal

| Outcome             | Abortion | Birth of PI calf | Poor fertility | Suppressed immunity | Weak neonates | Calf deaths | Deformities |
|---------------------|----------|------------------|----------------|---------------------|---------------|-------------|-------------|
| Percentage response | 80.4%    | 78.3%            | 77.2%          | 66.3%               | 66.3%         | 53.8%       | 46.7%       |

# Results: Understanding about BVDV

Table 2: Percentage of respondents (n=92) which identified each of the listed routes as possible ways by which BVDV can be transmitted

| Method of spread    | via a PI calf | via saliva and nasal secretions | via abortion material | via transiently-infected animals | via faeces | via semen |
|---------------------|---------------|---------------------------------|-----------------------|----------------------------------|------------|-----------|
| Percentage response | 90.3%         | 62.0%                           | 55.4%                 | 50.5%                            | 40.2%      | 34.1%     |

# Results: Understanding about BVDV

Question:

Persistently-infected (PI) animals arise due to...?

| Foetal infection | Suckling-calf infection | Post-weaning infection |
|------------------|-------------------------|------------------------|
| 86.4%            | 22.2%                   | 21.0%                  |

## Results: Advice on BVDV

Question:

Do you seek advice from your vet regarding...?

| General advice on BVDV | BVDV testing | Vaccination against BVDV |
|------------------------|--------------|--------------------------|
| 76.6%                  | 67.5%        | 65.9%                    |

(Proportionally more advice sought in NSW v Vic,  $P < 0.05$ )

## Results: Testing for BVDV

- Testing for BVDV via antibody testing 36% (27/75)
- Testing for BVDV via antigen testing 34.7% (26/75)
- 13 respondents undertook both
- Proportionally more testing conducted in NSW v Vic, 31/49 v 8/25, respectively,  $P < 0.05$

## Results: Control of BVDV

BVDV control conducted by 35.3% of respondents (36/102)

| Vaccination | Deliberate exposure |
|-------------|---------------------|
| 83.3%       | 16.6%               |

## Results: Sources of vaccine

| <b>Retailers</b> | <b>Online</b> | <b>Local veterinarian</b> |
|------------------|---------------|---------------------------|
| 86.2%            | 3.4%          | 10.3%                     |



## Results: Vaccination process

- Median period respondents conducted vaccination
  - 5 yrs
- Completion of vaccination course prior to breeding events:
  - range 1 week to >4 months
  - most common interval, 4 – 6 weeks (33%)
  - more than 2 weeks (80%)
- Vaccination of bulls undertaken by 65.5% of producers

## Results: Vaccination frequency

- Primary vaccination course consists of 2 injections (96.3%)
- Most common interval: 4-8 weeks
- Correct route of administration (100%)
- Correct vaccine volume (86%)
- Most producers (80%) report vaccinating annually...  
...but only 56.7% have done so in the past 12 months.

## Results: Vaccination practice

- Additional treatments alongside vaccine - 83.3%
- All respondents chill vaccine until the 'day of use'
- Chilling maintained on day of use – 85.7%  
(e.g. Ice-brick in cool-box)

## Results: Deliberate exposure

- 6 farms: NSW = 4; Vic = 2
- Five report sourcing the PI animal from own herd
- Duration of exposure:
  - 3mo – ‘all year’; mode = 6mo
- Timing of removal prior to breeding:
  - range 2wks – 1mo
  - (1 farm runs PI “all-year-round”)

## Conclusions – ‘understanding’

- Varying levels of understanding re: BVDV and its spread
- Impact on fertility and abortion is well-understood...  
...but the impact on immune system is less so
- Role of the PI calf is well understood...  
... but the potential involvement of semen and faeces in spreading the virus is less well acknowledged

## Conclusions – ‘control’

- Varying levels of engagement –  $\frac{1}{3}$  undertake measures
- Use of vaccination is increasing (c.f. Sacket et al, 2006)
- Reasonably good compliance with vaccine datasheet
- Some high-risk behaviour continues (especially timings!)
- Similar concerns about conduct of deliberate exposure

# So what?

- We now understand better what producers are doing!
- ...but why are they doing it that way?
- ...what are the drivers?
- ...is it appropriate, or even necessary, to change?

# Acknowledgements

Thank you to...

- The Graham Centre for Agricultural Innovation at CSU, for funding this research
- Zoetis for sponsoring access to the mailing list
- Mrs Lynne Hayes for collation of the data
- Co-authors for support and suggestions