BVDV Update

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Topics

- Emerging pestiviruses
- Serological surveillance
- Withdrawal of contaminated vaccine
Emerging pestiviruses

- Porcine
  - Bungowannah
    - Limited sporadic outbreaks
    - Congenital tremors
    - Newly identified
    - Preliminary results indicate widespread in US

- Wildlife
  - Giraffe
  - Pronghorn
    - Circulating in mule deer, antelope, mountain goat and big horn sheep in US

- Bovine
  - HoBi-like
    - Predominant bovine pestivirus in India
    - Region differences
      - Asian
      - South American/European
Might be more accurate to say **Bovine Pestivirus**

- Bovine Pestiviruses
  - BVDV1
    - Europe, Asia, Southeast Asia, North America, South America, Australia
  - BVDV2
    - Europe, Asia, Southeast Asia, North America, South America
  - HoBi-like viruses
    - Europe, Asia, Southeast Asia, South America
Surveillance

- **PI**
  - Low incidence and lack of specific tests
  - May have sample stability problem

- **Exposure – Serology**
  - No problem with storage of samples
  - Preliminary research suggest response to 3 species can be differentiated
  - It is possible to differentiate serological response
HoBi-like PI generation

Neutralizing antibodies – Dams of PI calves

<table>
<thead>
<tr>
<th>Heifer/virus</th>
<th>HoBi D32/00</th>
<th>BVDV1</th>
<th>BVDV2</th>
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Bovine pestivirus exposure in US cattle

- Brucellosis testing at slaughter program
- Starting in October, 2014 received about 200 serum per month from US packing plants, excluding plants in Texas, Alaska and Hawaii
- Random selection
- Goal was at least 2000 samples
- Samples were tested individually (no pooling)
Testing on first 600 samples

RT-PCR
- “Panpestiviruses”
- HoBi-like specific

Virus neutralization
- BVDV-1
- BVDV-2
- HoBi-like

Buhnerkempe et al. 2014
1972 total samples
Comparing titers

- Just averaging titers is not very informative
  - Variation among cross reactivities developed by different animals
  - Variation among sera
    - High titer sera versus low titer sera
- Comparative ratios
Comparative titer ratios

\[
\frac{3 \times A}{A+B+C}
\]

Where A, B and C are titers against the three different bovine pestivirus species

Antibodies are specific for one species when ratio is 0.2 higher

6 categories –

No antibodies, Clearly BVDV1, Clearly BVDV2, Clearly HoBi-like, Clearly BVDV, Equivocal
Number of sera placed in categories determined by comparison of R values
<table>
<thead>
<tr>
<th>Samples rated equivocal with higher titer against HoBi</th>
<th>BVDV1 titer</th>
<th>BVDV2 titer</th>
<th>HoBi-like titer</th>
<th>region</th>
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</table>
Regional differences

Exposure ranged from 81% to 96%
Regional differences in titers
Breakdown of antibodies against BVDV

Clearly BVDV1

% of R values
Breakdown of antibodies against BVDV

Clearly BVDV2

% of R values
Samples that were clearly higher against BVDV than HoBi, but could not differentiate whether it was predominately a BVDV1 response or a BVDV2 response
Level of protection

![Bar chart showing the level of protection for different categories: < 16, 16 - 256, > 256. The categories are represented by different colors: BVDV1 (green), BVDV2 (olive), HoBi-like (blue). The y-axis represents the level of protection, ranging from 0 to 70. The chart shows a comparison of protection levels for the three categories.](chart-image)