Prevalence of viral and bacterial pathogens in nasopharyngeal and pharyngeal recess regions of Holstein calves with and without signs of clinical bovine respiratory disease

Annual Report Summary:

Pathogen Information – Completion of Tulare Calves’ Study Sampling
PREVALENCE OF VIRAL AND BACTERIAL PATHOGENS IN NASOPHARYNGEAL AND PHARYNGEAL RECESS REGIONS OF HOLSTEIN CALVES WITH AND WITHOUT SIGNS OF CLINICAL BOVINE RESPIRATORY DISEASE

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II. Materials & Methods:
A case-control study of bovine respiratory disease (BRD) in young Holstein calves

- Evaluate the association of viral and bacterial pathogens from the nasopharyngeal and pharyngeal recess regions

- Holstein bull and heifer calves ranging in age from 35 to 55 days as cases of BRD
  - CASES = BRD scores of 5 or greater based upon the University of Wisconsin calf respiratory scoring system which evaluated rectal temperature, cough, nasal and eye discharges, and ear position or head tilt.
  - Controls = BRD scores <5 (3 or less, typically)
  - Target for N = 1,000 cases & 1,000 controls

- Holstein bull and heifer calves ranging in age from 35 to 55 days
  - Mid-nasal and deep pharyngeal swabs
  - Cultured for bacteria and Mycoplasma spp.
  - PCR for BCV, BRSV, BVDV, and IBR virus
  - Blood samples for genetic analysis

- Chi-Square Statistics for Crosstabs Data (P < 0.05) [SPSS]
- OR’s & 95% CI’s: Conditional Logistic Regression for Matched Case-Control Studies
III. Results:

<table>
<thead>
<tr>
<th></th>
<th>Bulls</th>
<th>Heifers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td>625</td>
<td>398</td>
<td>1023</td>
</tr>
<tr>
<td>Percent</td>
<td>61.1%</td>
<td>38.9%</td>
<td></td>
</tr>
<tr>
<td>Controls</td>
<td>655</td>
<td>352</td>
<td>1007</td>
</tr>
<tr>
<td>Percent</td>
<td>65.2%</td>
<td>34.8%</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>1280</td>
<td>750</td>
<td>2030</td>
</tr>
<tr>
<td></td>
<td>63.1%</td>
<td>36.9%</td>
<td></td>
</tr>
</tbody>
</table>

Rectal Temperature Histogram

Case mean = 103.1  Control mean = 101.3

P < 0.001
Bovine Coronavirus Histogram

Odds Ratio for BCV Positive: OR = 1.30; (95% CI = 0.96, 1.65)

BRSV Histogram

Odds Ratio for BRSV Positive: OR = 4.51; (95% CI = 4.15, 4.87)
### Other Virus PCR Results

- **BVDV**
  - No positive results
  - Only 1 indeterminate result

- **IBR**
  - No positive results
  - 3 indeterminate results
  - 2 cases
  - 1 control

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**Mycoplasma spp. Histogram**

Odds Ratio for any *Mycoplasma* spp.:

\[
OR = 1.60; \quad (95\% CI = 1.36, 1.85)
\]
### Histophilus somni Histogram

#### Odds Ratio for *H. somni*:

**OR = 4.26; (95% CI = 3.17, 5.35)**

### Mannheimia haemolytica Histogram

#### Odds Ratio for *M. haemolytica*:

**OR = 2.95; (95% CI = 2.64, 3.25)**
IV. Conclusions:

- Nasopharyngeal and pharyngeal recess swabs provided significant diagnostic prevalence information about important BRD pathogens.
- All 2,030 samples tested for BVDV were negative.
- These negative BVDV findings are equivalent to a maximum disease prevalence of 0.14% in a population of 10,000 to 40,000 calves. (Less than 2 per 1,000)
- Cases of BRD were significantly associated with these pathogens: BRSV, *Mannheimia haemolytica*, *Pasteurella multocida*, *Histophilus somni*, and *Mycoplasma* spp.

\[ \text{Odds Ratio for } P. \text{ multocida: } OR = 2.72; \text{ (95\% CI = 2.46, 2.98)} \]