2006

Evaluating Several Media for the Recovery of Organisms Associated with Infectious Bovine Keratoconjunctivitis in Beef Calves

Annette O'Connor
Iowa State University

Joann Kinyon
Iowa State University

Allison Whipple
Iowa State University

Recommended Citation

This Beef is brought to you for free and open access by the Animal Science Research Reports at Iowa State University Digital Repository. It has been accepted for inclusion in Animal Industry Report by an authorized editor of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
Evaluating Several Media for the Recovery of Organisms Associated with Infectious Bovine Keratoconjunctivitis in Beef Calves

A.S. Leaflet R2064

Annette O’Connor, assistant professor of veterinary diagnostic and production animal medicine; Joann Kinyon, assistant scientist of veterinary diagnostic and production animal medicine; Allison Whipple, summer research assistant

Summary and Implications

The use of a Moraxella bovis selective agar, preferentially over sheep’s blood agar, may be a valuable method to increase laboratory culture recovery of M. bovis and M. ovis from IBK cases where those organisms are suspected. There was no difference in recovery rates from SBA plates incubated at 5 or 10% CO₂. It remains to be determined if increased recovery is clinically significant and associated with disease occurrence.

Introduction

Infectious bovine keratoconjunctivitis (IBK) is a major economic problem in the cattle industry because of treatment and labor costs, but more significantly, due to reduced weaning and slaughter weights of affected animals. Moraxella bovis (M. bovis) is often described as the causative agent of infectious bovine keratoconjunctivitis or Pinkeye. Moraxella ovis (M. ovis), Infectious Bovine Rhinotracheitis and Mycoplasma bovis may also be a causal organisms.

Confirmation of the presence of Moraxella bovis in cases of IBK is often sought by veterinarians to ensure correct diagnosis of the disease as the differential diagnosis, such as Infectious Bovine Rhinotracheitis and Mycoplasma bovis, require different treatments and preventive practices. However, Moraxella bovis, is a difficult organism to isolate from clinical cases of IBK, meaning that the organism is not often isolated from calves that appear to be infected. Estimates of the sensitivity of the current culture method are around 20%, meaning that of 100 animals truly infected we only expect to recover Moraxella bovis in 20 cases. Recovery of Moraxella bovis from clinical cases may be difficult because the organism is fastidious in its growth requirements, poor handling prior to shipment and delayed shipment. In a recent research project looking at respiratory organism in nasal and ocular swabs of cattle on an experimental media, we frequently isolated Moraxella bovis. The aim of this project was to test the hypothesis that the experimental media will improve the recovery of Moraxella bovis compared to the traditional media currently used. The experimental media is a BHI with yeast extract (0.5%) agar base with 10% bovine blood and lincomycin and cyclohexamide inhibitors. The traditional media is a trypticase soy agar with 5% or 10% sheep blood.

Materials and Methods

In early June 2004, corneal swabs were collected from 121 calves. Subsequently, the calves were observed for signs of IBK by farm staff for the remaining season. The eyes of calves with IBK were swabbed as well as 1-3 unaffected pen mates. The swabs were submitted to ISU VDL Bacteriology Lab for culture using MbSA and two SBA CO₂ plates within four hours of collection. The plates were observed for growth at 24 and 48 hours. β-hemolytic suspect colonies were plated onto SBA to obtain pure cultures and standard identification tests were performed to determine whether M. bovis or M. ovis were present. The null hypotheses were tested using Exact McNemar’s test for paired proportions.

Results and Discussion

From the 121 animals swabbed during June no M. bovis was isolated on either SBA or MbSA and M. ovis was isolated from 19% and 28% of animals, SBA and MbSA respectively, with an agreement of 77%.

In the longitudinal IBK agar comparison, M. bovis was recovered by SBA 7% and MbSA 19% of the time with an agreement of 85%, M. ovis was recovered by SBA 12% and MbSA 44% of the time with an agreement of 83%.

It was demonstrated that the use of MbSA, preferentially over SBA, may be a valuable method to increase laboratory culture recovery of M. bovis and M. ovis from IBK cases where those organisms are suspected. There was no difference in recovery rates from SBA plates incubated at 5 or 10% CO₂. It remains to be determined if increased recovery is clinically significant and associated with disease occurrence.

Acknowledgments

Funded by Iowa Veterinary Medical Association and Iowa Livestock Health Advisory Council

Allison Whipple participated in this project as part of The Veterinary Summer Scholar Research Program, The College of Veterinary Medicine, Iowa State University.
Table 1. Frequency distribution of agreement and disagreement for recovery of *Moraxella bovis* and *Moraxella ovis* from two media.

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>MbSA negative</th>
<th>MbSA positive</th>
<th>MbSA negative</th>
<th>MbSA positive</th>
<th>% agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SBA 5%</td>
<td>SBA 5%</td>
<td>SBA 5%</td>
<td>SBA 5%</td>
<td>(Kappa)</td>
</tr>
<tr>
<td><strong>M. bovis all animals</strong></td>
<td>159</td>
<td>128</td>
<td>6</td>
<td>24</td>
<td>1</td>
<td>84% (0.3)</td>
</tr>
<tr>
<td><strong>M. bovis cases</strong></td>
<td>101</td>
<td>81</td>
<td>5</td>
<td>14</td>
<td>1</td>
<td>85% (0.3)</td>
</tr>
<tr>
<td><strong>M. bovis controls</strong></td>
<td>58</td>
<td>47</td>
<td>1</td>
<td>10</td>
<td>0</td>
<td>83% (0.1)</td>
</tr>
<tr>
<td><strong>M. ovis all animals</strong></td>
<td>159</td>
<td>110</td>
<td>21</td>
<td>25</td>
<td>3</td>
<td>83% (0.5)</td>
</tr>
<tr>
<td><strong>M. ovis cases</strong></td>
<td>101</td>
<td>64</td>
<td>19</td>
<td>15</td>
<td>3</td>
<td>82% (0.6)</td>
</tr>
<tr>
<td><strong>M. ovis controls</strong></td>
<td>58</td>
<td>46</td>
<td>2</td>
<td>10</td>
<td>0</td>
<td>83% (0.2)</td>
</tr>
</tbody>
</table>