

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

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Summary and Implications

The use of a *Moraxella bovis* selective agar, preferentially over sheeps 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.

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Table 1. Frequency distribution of agreement and disagreement for recovery of *Moraxella bovis* and *Moraxella ovis* from two media.

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