

Department of Production Animal Health



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# Frequency, clinical presentation, and risk factors associated with *Mycoplasma bovis* outbreaks in western Canadian farmed bison

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**ALMA**  
Alberta Livestock  
and Meat Agency Ltd.



 UNIVERSITY OF  
SASKATCHEWAN  
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# *Mycoplasma* – The Bug

- *Mycoplasma bovis* – a challenging organism!
  - First report in 1960's in cattle → very common among cattle
  - Causes:
    - **Chronic pneumonia and polyarthritis syndrome (CPPS)**
    - Aar infection, mastitis, reproductive disease



<http://www.ansi.okstate.edu/breeds/cattle/limousin/>



# *Mycoplasma* In Cattle

## Cattle:

- Secondary/Concurrent invader in Bovine Respiratory Disease
- Calves and young feedlot animals (CPPS)



<http://www.ansi.okstate.edu/breeds/cattle/limousin/>

# *Mycoplasma* – Cattle vs Bison

## Cattle:

- Secondary/Concurrent invader in Bovine Respiratory Disease
- Calves and young feedlot animals (CPPS)

## Bison:

- Primary agent in Respiratory Disease
- Older, breeding animals on pasture

Similar management techniques and lesions



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# *Mycoplasma* In Bison

- 1999 - First anecdotal reports of *M. bovis* outbreaks in farmed bison
- Only four previous published reports:
  - North Dakota feedlot with CPPS-like disease (Dyer et al., 2008);
  - Kansas cow-calf operation with 27% mortality (Janardhan et al., 2010);
  - Midwestern United States with pharyngitis (Dyer et al., 2013);
  - Abortion and reproductive problems associated with *M. bovis* (Register et al., 2013).
- Mortality study (Alberta, 2011) – 42 out of 102 deaths caused by *M. bovis* (Burrage et al., 2012)

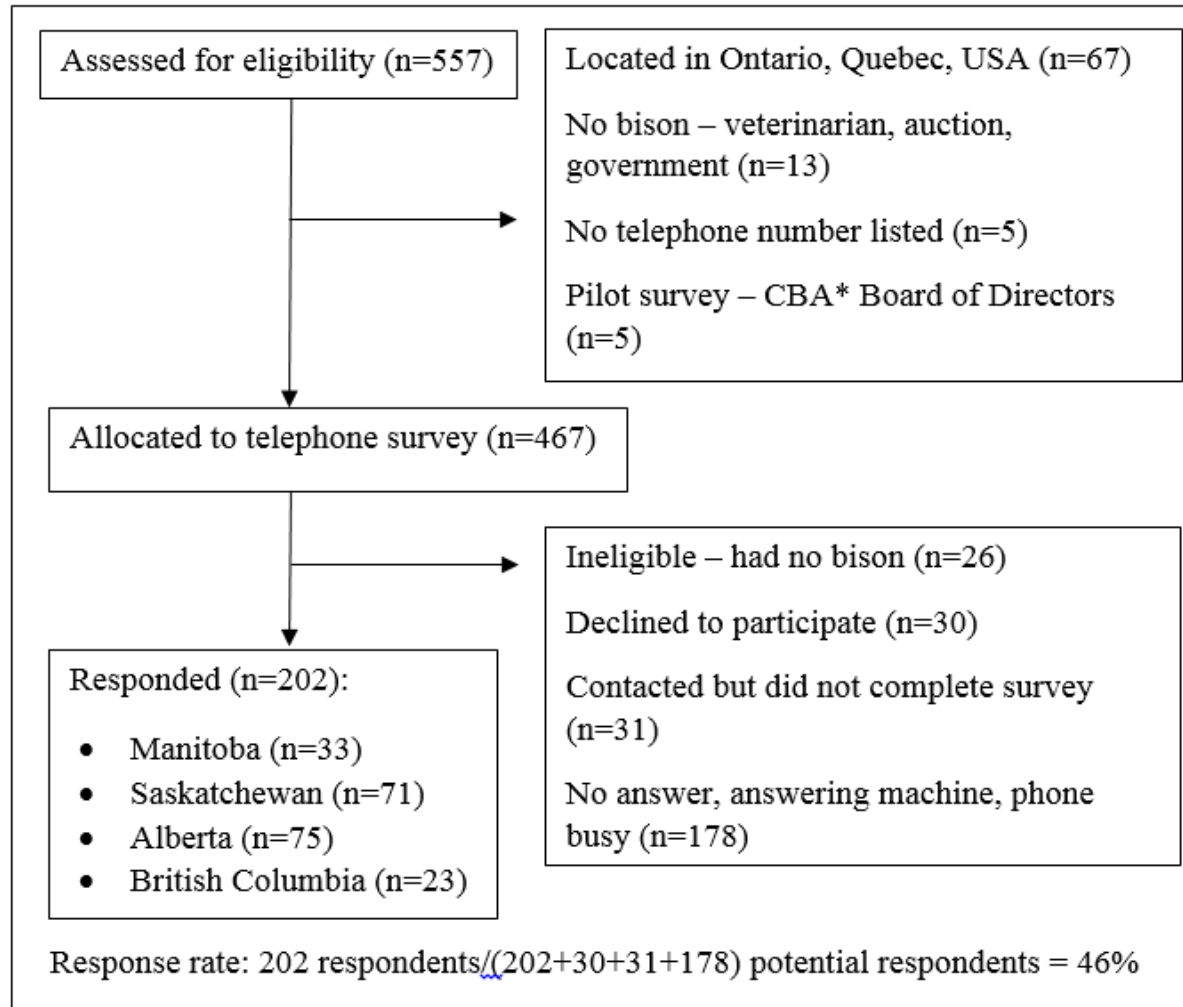


# Objectives

- To determine the frequency and distribution of disease caused by *M. bovis* infection in farmed bison herds throughout Western Canada
- To describe the clinical presentation of the disease
- To evaluate the association between the development of disease caused by *M. bovis* infection and herd-level risk factors

# Telephone Interview - Selection

Bison producers listed as members of the Canadian Bison Association (CBA) in 2013 and 2014 in Western Canada





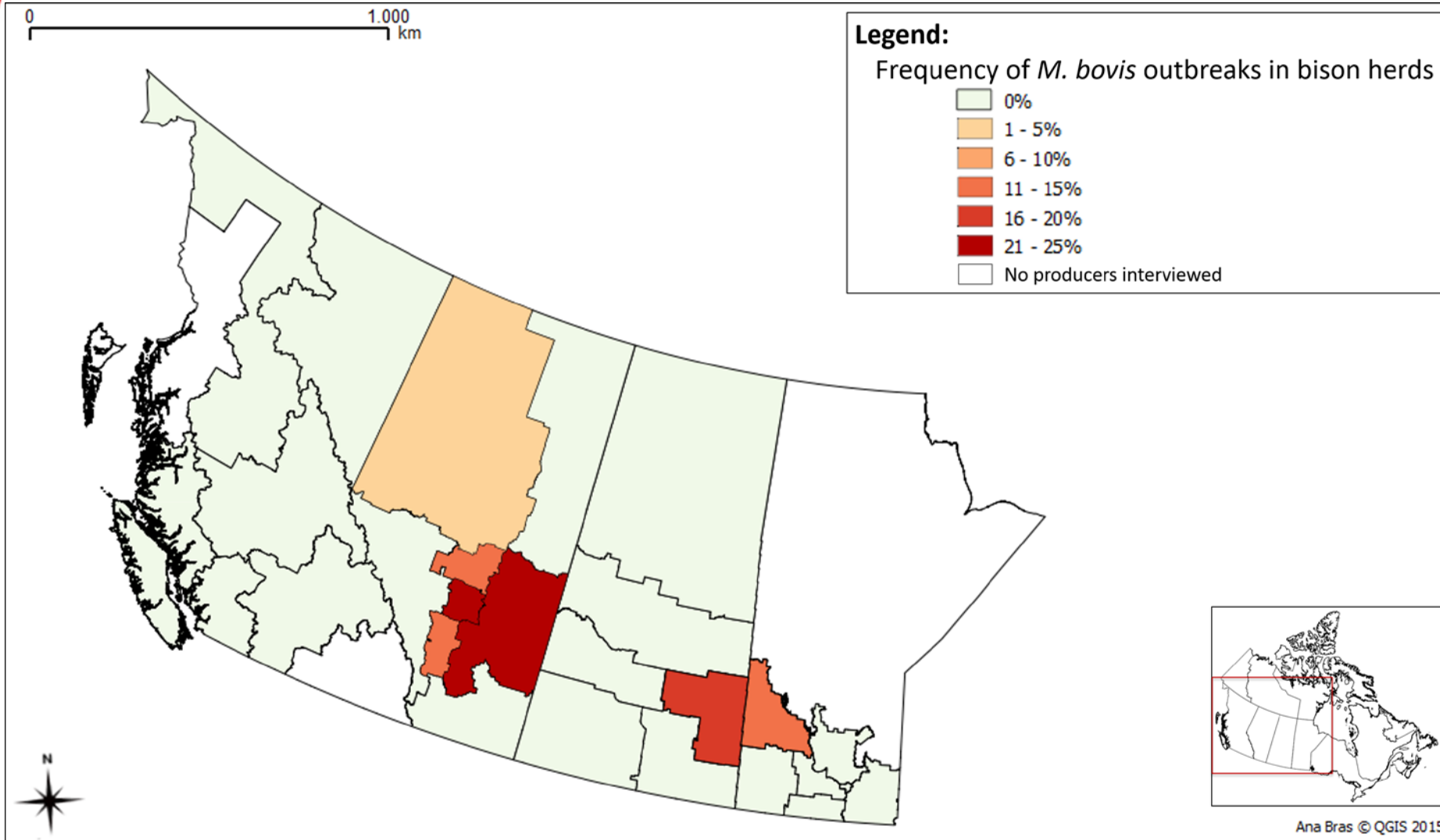
# Number of *M. bovis* Outbreaks

**Affected herd:** a farmed bison operation with laboratory-confirmed diagnosis of *M. bovis*, with onset on or after April 30, 2009 up to April 30, 2015.

Province	Affected herds (%)	Total participants
Manitoba	1 (3%)	33
Saskatchewan	1 (1%)	71
Alberta	10 (13%)	75
British Columbia	0 (0%)	23
<b>Total</b>	<b>12 (6%)</b>	<b>202</b>



# Distribution of *M. bovis* Outbreaks





# Clinical Presentation

Clinical signs	Unaffected herds (%) n=189	Affected herds (%) n=12
Lameness	37 (20%)	10 (83%)
Reluctance to move	40 (21%)	11 (92%)
Swollen joints	9 (5%)	12 (100%)
Difficulty breathing	11 (6%)	11 (92%)
Coughing	23 (12%)	10 (83%)
Sluggishness	11 (6%)	10 (83%)
Weight loss	81 (43%)	12 (100%)
Reproductive problems	13 (7%)	5 (42%)

# Clinical Presentation

- **Clinical signs** persisted: **12 weeks** (min=1 week, max=96 week)
- In **7** affected herds, **no animals recovered**
- In **5** affected herds, **at least one** animal recovered
  - 4 to 48 weeks



# Clinical Presentation

Age group	Mean % bison with clinical signs	Mean % deaths
Unweaned calves	0%	0%
Weaned calves < 1 year of age	0.4%	0,4%
Yearlings 1 to 2 years old	6%	5%
Bison 2 to 3 years old	3%	0,3%
Cows 3 years or older	13%	11%
Bulls 3 years or older	7%	3%
Total		

# Operation and Management Characteristics

- **Closed herd** was associated with **being an unaffected herd** ( $P < 0.001$ )
- **Feedlots and combined operations** were **17 times more likely to be affected herds** compared with cow-calf operations ( $P < 0.001$ )
- **Higher risk** of *M. bovis* outbreak in herds that **purchase new animals from multiple sources** ( $P < 0.001$ )
- Operations with **both farmed bison and cattle** were **4 times more likely to be affected herds** compared to operations with only bison or bison and other types of farmed animals ( $P = 0.05$ )

# In The Future...

## —Case-Control study:

- Herds from the Mortality Study and Phone interview respondents

## —Serum samples collected:

Antibody ELISA assay

- “Seroprevalence” → 40 animals/herd
- “Are herds naïve?” → 60 animals/herd

Case herds:



Control herds:



QUESTIONNAIRE

- Very often
- Often
- Sometimes
- Rarely

## Take Home Message...

- *Mycoplasma bovis* affected 6% of farmed bison operations in Western Canada.
- All affected herds saw swollen joints, weight loss
- Higher risk for:
  - Feedlot and combined operations
  - Operations that purchase animals from multiple sources
  - Operations with both farmed bison and cattle



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# Thank you!