


Wildlife Disease Surveillance
Highlights for Region V Board of
Game Staff Report



Prepared by: Kimberlee Beckmen, M.S., D.V.M., Ph.D.
Wildlife Health Veterinarian
Alaska Department of Fish & Game



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Outline

- Disease surveillance sampling and testing-caribou
- Validation of biomarkers of caribou health
- Muskox Respiratory Pathogen Surveillance
- Retrospective serologic studies of an emerging pathogen of muskox: *Erysipelothrix rhusiopathiae*



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FY19/20 Disease Surveillance Sampling and Testing- Caribou

- No unusual mortalities or events reported
- Archived tissues, feces and sera utilized for retrospective parasite and pathogen studies
- Rangiferine brucellosis-enzootic low level equilibrium
 - Sporadic, rare observations of Mulchatna caribou with infected joints
 - Due to strict CDC regulations to prevent human infections, it is no longer recommended to sample or test suspected cases in individual caribou



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FY19/20 Disease Surveillance Sampling and Testing-Caribou

- Archived lungs, tonsils and nasal swabs tested by culture and molecular techniques as available for respiratory pathogens of concern: mycoplasmas, viruses, Pestivirus (formerly BVD), Cervid Adenovirus
 - M. ovi detectable in caribou samples in the earliest available (year)
 - Western Arctic-(2016), 2.5% of samples
 - Teshekpuk – (2012), 8.8% of samples
 - Mulchatna- (2014) 8.9% of samples
 - Detection in the upper respiratory tracts of caribou does not appear to be a current health concern for any caribou populations
 - Other respiratory pathogens not detected except for typical bacteria associated with respiratory tract



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FY19/20 Disease Surveillance Sampling and Testing-Caribou

- Leptospirosis
 - Bacteria shed in urine and reproductive tissues
 - Causes abortion, kidney and liver disease
 - Detected by PCR in kidneys of caribou collected at Red Dog mine for other studies
 - Previously had serology indications of exposure
 - This is the first step in determining what biovar is present in caribou and if it has zoonotic importance



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Biomarkers of Caribou Health feasibility / study design stage

- ❖ What is a healthy free-ranging caribou?
- ❖ How do you measure health from the samples/data we have collected or should collect?
- ❖ Arctic herd managers, researchers, biometricians and wildlife health veterinary program staff working together to assess and validate what we should monitor and what it means for caribou population or individual 'health status'

Biomarkers of inflammation:
Haptoglobins and Serum amyloid A

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FY20 Respiratory Pathogen Surveillance – Muskox

- Lungs 2006-2017 n=31 (NW & ENS)
 - All negative PCR
 - *M. ovipneumoniae*
 - Bovine Coronavirus
 - Bovine Herpesvirus-1 (IBR)
 - Respiratory Syncytial virus
 - Pestiviruses A & B (formerly BVD 1 & 2)
 - 2018-2019 necropsies negative for *M. ovipneumoniae*
- Nasal swabs (collected '07-'19) FY18-19 tested for *M. ovipneumoniae*
 - NW n=129, ENS n=29, SW n=17
 - all NEGATIVE



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Erysipelothrix rhusiopathiae in muskox and caribou

- Bacteria recently recognized as causing mass mortality events in muskox in Canada
- Detected by PCR in bone marrow of muskox northern Seward Peninsula 2009-2012 when experiencing high mortality rates
- Death by blood poisoning



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Conclusions, Implications

There is widespread exposure to E. rhusiopathiae in muskox and caribou in AK

- Although it isn't new, at least in muskoxen, increased exposure in recent years concurrent with population declines
- This may be due to one or more factors
 - Changes in host species vulnerability
 - Increased pathogen virulence
 - Ability to persist in populations or the environment
- It may be a concern for population health in the future
- Manuscript in press Plos One

