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#### **Outline**

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





# 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

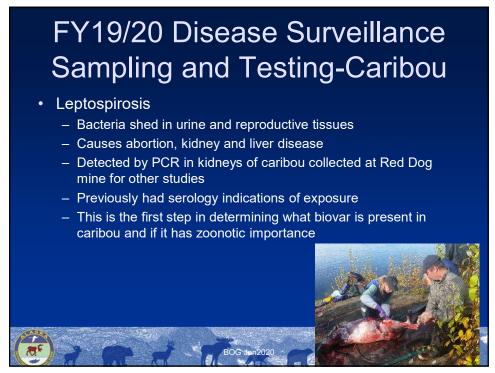


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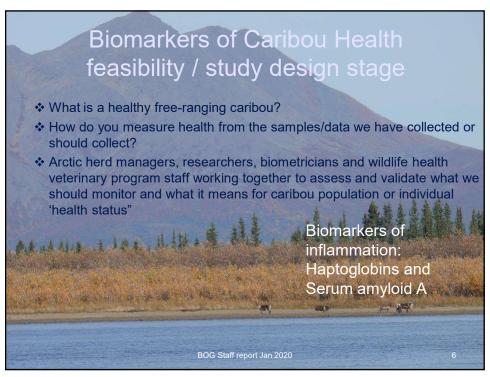
## FY19/20 Disease Surveillance Sampling and Testing-Caribou

- 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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# 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

