UiT THE ARCTIC UNIVERSITY OF NORWAY

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# **CROSS-BORDER TRANSMISSION OF BRUCELLA SUIS BIOVAR 4 BETWEEN RUSSIA AND NORWAY?**

# A CALL-OUT FOR COOPERATIVE EFFORTS



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#### Brucella suis biovar 4 in reindeer/caribou and moose

B. suis bv. 4 is the causative agent of brucellosis in reindeer/caribou (Rangifer tarandus spp.) 1 (Fig. 1). The most frequently reported clinical signs are reproductive problems in both sexes and swelling of the joints (Fig. 2) 2-7. The disease is present in Alaska 8, Canada 9 and Siberia 10. The disease is assumed absent in Greenland 7, Svalbard (pers. obs. Nymo) and mainland Norway 11,12. Moose (Alces alces) (Fig. 3) may also be infected with B. suis bv. 4 and can transmit the infection to reindeer/caribou 13,14. B. suis bv. 4 cause brucellosis in humans 1.



Fig. 1. Norwegian reindeer (R. t. tarandus). Photo: Tryland, UiT -The Arctic University of Tromsø.



Fig. 2. Swollen carpus due to infection with B. suis bv. 4. Photo: Wobeser, Canadian Cooperative Wildlife Health Centre.



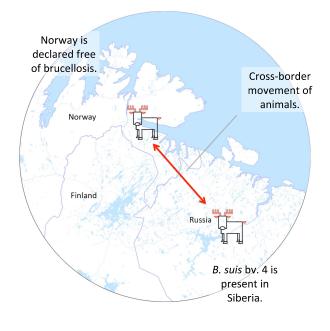
Fig. 3. Moose. Photo: Arnemo, Hedmark University College.



Fig. 4. Norwegian - Russian river border. Photo: Røst, Dagbladet.

#### Transmission of B. suis bv. 4

Transmission of Brucella spp. usually takes place through contact with aborted, infected material 15. Brucella spp. persist for years in frozen material and for months under moist conditions at 10-15°C 16, thus facilitating transfer in Arctic regions without direct contact between animals.



### Norwegian - Russian border

Norway and Russia share a 196 km long border, twothirds along rivers <sup>17</sup> (Fig. 4). There are fences in some areas, but of such character that animals may pass. Animals may swim the rivers in summer, or walk over the ice in winter. Reindeer moving from Norway to Russia have been observed and are either herded back or euthanized (Pers. comm. border patrol agent Mathisen 25.02.15). There is also a migration route for moose crossing the border with 50-200 moose migrating each year 18.

Aim

We would like to establish collaboration with researchers for the purpose of applying for further funding and evaluating samples from both species from the border region.

## Conclusion

A larger scale investigation involving samples from reindeer and moose in the border region should be conducted to evaluate the risk of trans-border movement of B. suis by. 4.

References
1. Corbel et al. Bergey's Manual of Systematic Bacteriology. Volume Two: The Proteobacteria. 2. Ferguson. Rangiferine brucellosis on Baffin Island. 3. Forbes. Isolates of Brucello suis blovar 4 from animals and humans in Canada, 1982-1990. 4. Rausch et al. Brucellosis in Reindeer, Rangifer-Tarondus L., inoculated experimentally with Brucella-Suis, Type-4. 5. Tessaro et al. Brucello suis biotype 4: a case of granulomatous nephritis in a barren ground caribou (Rangifer torandus groenlandicus L.) with a review of the distribution of rangiferine brucellosis in Canada. 6. Nelland et al. The diseases and parasites of Alaskan wildlife populations, Part I: Some observations on Brucellosis in caribou. 7.0 Picellly et al. Brucellosis in Canada. 6. Nelland et al. The diseases and parasites of Alaskan wildlife populations, Part I: Some observations on Brucellosis in Canada. 6. Nelland et al. Hercillosis in Canada. 6. Nelland et al. The diseases and parasites of Alaskan wildlife populations, Part I: Some observations on Brucellosis in Canada. 6. Nelland et al. Hercillosis in Canada. 6. Nelland et al. Hercillosis in Canada. 6. Nelland et al. Hercillosis in Canada. 4. A Disease in Canada. 9. Nelland et al. Representations of Brucellosis in Canada. 8. A Disease in Canada. 9. Nelland et al. Representations of Brucellosis in Canada. 9. Nelland et al. Representations of Brucellosis in Canada. 9. Nelland et al. Representations of Brucellosis in Canada. 9. Nelland et al. Representations of Brucellosis in Canada. 9. Nelland et al. Representations of Brucellosis in Canada. 9. Nelland et al. Representations of Brucellosis in Canada. 9. Nelland et al. Representations of Brucellosis in Canada. 9. Nelland et al. Representations of Brucellosis in Canada. 9. Nelland et al. Representations of Brucellosis in Canada. 9. Nelland et al. Representations of Brucellosis in Canada. 9. Nelland et al. Representations of Brucellosis in Canada. 9. Nelland et al. Representations of Brucellosis in Canada. 9. Nelland et al. Representations of B