

BIOGRAPHICAL SKETCH

NAME: Besser, Thomas Eugene

POSITION TITLE: Professor of Microbiology (emeritus)

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
University of Wisconsin, Madison	B.S.	06/1973	Zoology
University of Minnesota, Twin Cities	D.V.M.	06/1981	Veterinary Medicine
Washington State University, Pullman	Ph.D.	06/1986	Immunology

A. Positions and Employment

1982 - 1986 Resident. Vet. Internal Medicine, Washington State University (WSU), Pullman, WA.
1986 - 1989 Assistant Professor, Dept. of Veterinary Clinical Medicine and Surgery, CVM, WSU.
1989 - 1994 Assistant Professor, Dept. of Veterinary Microbiology and Pathology, CVM, WSU.
1994 - 2000 Associate Professor, Dept. of Veterinary Microbiology and Pathology, CVM, WSU.
2001 - 2004 Director of Laboratory Services, WA Animal Disease Diagnostic Lab., WSU.
2000 - 2019 Professor, Dept. of Veterinary Microbiology and Pathology, CVM, WSU
2016 - 2019 Wild Sheep Foundation Rocky Crate Endowed Chair in Wild Sheep Disease Research.
2019-present Emeritus Professor, Dept. of Veterinary Microbiology and Pathology, CVM, WSU.

B. Other certifications, honors and awards

1998 Diplomate, Am Coll Veterinary Microbiologists: Bacteriology/Mycology/Immunology
2000 US-UK Fulbright Research Fellow in Food Safety Research. University of Edinburgh
2007 Pfizer Award Research Excellence, College of Veterinary Medicine, WSU
2007 Distinguished Research Alumnus, College of Veterinary Medicine, Univ. of Minnesota.
2007, 2009 WSU Innovator; Washington State Univ.
2009 - 2012 ACVM Board of Governors
2010-2019 Washington State Academy of Sciences
2012-2019 Fellow, American Association for the Advancement of Science
2014 Sahlin Faculty Excellence Award in Research, Scholarship and the Arts

C. Selected bighorn sheep pneumonia-related refereed publications:

1. **TE Besser**, EF Cassirer. Chapter 9. Epizootic Bighorn Sheep Pneumonia Caused by *Mycoplasma ovipneumoniae* IN: Radcliffe, R.W., & Jessup, D.A. (2023). *Wildlife Disease and Health in Conservation*. Baltimore: Johns Hopkins University Press. <https://dx.doi.org/10.56021/9781421446745>.
2. Cassirer EF, **TE Besser**. Outcomes of Selective Removals for Control of Pneumonia in a Bighorn Sheep Metapopulation. *Ecology and Evolution*, 2025 - Wiley Online
3. Weyand LK, BL Felts, EF Cassirer, JA Jenks, DP Walsh, **TE Besser TE**. 2025. Fatal interactions: pneumonia in bighorn lambs following experimental exposure to carriers of *Mycoplasma ovipneumoniae*. *J Clin Microbiol* 63:e01328-24. <https://doi.org/10.1128/jcm.01328-24>
4. **Besser TE**, EF Cassirer, A Lisk, D Nelson, KR Manlove, PC Cross, JT Hogg. Natural history of a bighorn sheep pneumonia epizootic: Source of infection, course of disease, and pathogen clearance *Ecology and Evolution* 11(21)14366-14382. <https://doi.org/10.1002/ece3.8166>
5. Walsh DP, BL Felts, EF Cassirer, **TE Besser**, JA Jenks. Host vs. pathogen evolutionary arms race: effects of exposure history on individual response to a genetically diverse pathogen *Front. Ecol. Evol.*, 23 January 2023 Volume 10 - 2022 | <https://doi.org/10.3389/fevo.2022.1039234>
6. Andrews KR, **TE Besser**, T Stalder, EM Top, KN Baker, MW Fagnan, DD New, GM Schneider, A Gal, R Andrews-Dickert, SS Hunter, KB Beckmen, L Christensen, A Justice-Allen, D Konetchy, CP Lehman, K Manlove, H Miyasaki, T Nordeen, A Roug and EF Cassirer Comparative genomic analysis identifies potential adaptive variation in *Mycoplasma ovipneumoniae*, - *Microbial Genomics* 2024;10:001279 DOI 10.1099/mgen.0.001279.
7. Johnson T, K Jones, BT Jacobson, J Schearer, N Adams, I Thornton, C Mosdal, S Jones, M Jutila, A Rynda-Apple, **TE Besser**, D Bimczok. Experimental infection of specific-pathogen-free domestic lambs with *Mycoplasma ovipneumoniae*

causes asymptomatic colonization of the upper airways that is resistant to antibiotic treatment. Vet Microbiol 265, 109334, 2022.

8. Shirkey N, Roug A, **Besser TE**, Bleich VC, Darby N, Dekelaita D, Galloway NL, Gonzales B, Hughson D, Konde L, Monello R, Prentice PR, Vu R, Wehausen J, Munk B, Powers J, Epps CW. Previously Unrecognized Exposure of Desert Bighorn Sheep (*Ovis canadensis nelsoni*) to *Mycoplasma ovipneumoniae* in the California Mojave Desert. Journal of Wildlife Diseases, 57(2), 2021, OnLine First.
9. Werdel TJ, Jenks JA, **Besser TE**, Kanta JT, Lehman CP, Frink TJ. Restoration of a bighorn sheep population impeded by *Mycoplasma ovipneumoniae* exposure. Restoration Ecology 2020 28(2):387-95.
10. Garwood TJ, Lehman CP, Walsh DP, Cassirer EF, **Besser TE**, Jenks JA. Removal of chronic *Mycoplasma ovipneumoniae* carrier ewes eliminates pneumonia in a bighorn sheep population. Ecol Evol. 2020 Mar 5;10(7):3491-3502. doi: 10.1002/ece3.6146. eCollection 2020 Apr. PMID: 32274004
11. Kamath PL, Manlove K, Cassirer EF, Cross PC, **Besser TE**. Genetic structure of *Mycoplasma ovipneumoniae* informs pathogen spillover dynamics between domestic and wild Caprinae in the western United States. Sci Rep 2019. PubMed PMID: 31653889. PubMed Central PMCID: PMC6814754.
12. Ackerman MG, Schneider D, Baker K, **Besser TE**. Comparison of three methods of enumeration for *Mycoplasma ovipneumoniae* J Microbiol Methods 2019. PubMed PMID: 31446035.
13. Manlove KR, Sampson LM, Borremans B, Cassirer EF, Miller RS, Pepin KM, **Besser TE**, Cross PC. Epidemic growth rates and host movement patterns shape management performance for pathogen spillover at the wildlife-livestock interface Philos Trans R Soc Lond B Biol Sci 2019. PubMed PMID: 31401952. PubMed Central PMCID: PMC6711312.
14. Manlove K, Branan M, Baker K, Bradway D, Cassirer EF, Marshall KL, Miller RS, Sweeney S, Cross PC, **Besser TE**. Risk factors and productivity losses associated with *Mycoplasma ovipneumoniae* infection in United States domestic sheep operations Prev Vet Med 2019. PubMed PMID: 31097121.
15. **Besser TE**, Levy J, Ackerman M, Nelson D, Manlove K, Potter KA, Busboom J, Benson M. A pilot study of the effects of *Mycoplasma ovipneumoniae* exposure on domestic lamb growth and performance PLoS One 2019. PubMed PMID: 30730893. PubMed Central PMCID: PMC6366759.
16. Wolff PL, Blanchong JA, Nelson DD, Plummer PJ, McAdoo C, Cox M, **Besser TE**, Muñoz-Gutiérrez J, Anderson C. Detection of *Mycoplasma ovipneumoniae* in Pneumonic Mountain Goat (*Oreamnos americanus*) Kids. J Wildl Dis 2019. PubMed PMID: 30161017.
17. Plowright RK, Manlove KR, **Besser TE**, Páez DJ, Andrews KR, Matthews PE, Waits LP, Hudson PJ, Cassirer EF. 2017. Age-specific infectious period shapes dynamics of pneumonia in bighorn sheep. Ecol Lett 20(10):1325-1336.
18. **Besser TE**, Cassirer EF, Potter KA, Foreyt WJ. 2017. Exposure of bighorn sheep to domestic goats colonized with *Mycoplasma ovipneumoniae* induces sub-lethal pneumonia. PLoS one,12,6,e0178707.
19. Roug A, Diaz-Campos D, Teitzel C, **Besser TE**. 2016. Comparison of two bacterial transport media for culture of tonsillar swabs from bighorn sheep and mountain goats. J Wildlife Diseases 53:188-192.
20. Cassirer EF, Manlove K, Almberg E, Kamath P, Cox M, Wolff P, Shannon J, Robinson R, Harris R, Plowright R, Hudson P, Cross P, Dobson A, **Besser TE**. 2018. Pneumonia in bighorn sheep: Risk and resilience. J Wildlife Mgmt, 82:32-45.
21. Cassirer EF, **Besser TE**, Crider BL, Cross PC, Jenks JA, Manlove KR, Matthews P, Plowright RK, Walsh D, Wik P. 2015. Pneumonia in Bighorn Sheep: Testing the Super-Spreader Hypothesis. Intermountain J Sciences,21,1-4,60-61.
22. Cassirer EF, Manlove KR, Plowright RK, **Besser TE**. 2017. Evidence for strain-specific immunity to pneumonia in bighorn sheep. J Wildlife Mgmt 81(1)133-143.
23. Walsh DP, Cassirer EF, Bonds MD, Brown DR, Edwards WH, Weiser GC, Drew ML, Briggs RE, Fox KA, Miller MW, Shanthalingam S, Srikumaran S, **Besser TE**. 2016. Concordance in Diagnostic Testing for Respiratory Pathogens of Bighorn Sheep. Wildlife Society Bulletin 40(4):634-642.
24. **Besser TE**, Cassirer EF, Potter KA, Lahmers K, Oaks JL, Shanthalingam S, Srikumaran S, Foreyt WJ. 2014. Epizootic Pneumonia of Bighorn Sheep following Experimental Exposure to *Mycoplasma ovipneumoniae*. PLoS One 10;9(10):e110039.
25. Ziegler JC, Lahmers KK, Barrington GM, Parish SM, Kilzer K, Baker K, **Besser TE**. 2014. Safety and Immunogenicity of a *Mycoplasma ovipneumoniae* bacterin for domestic sheep (*Ovis aries*). PLoS ONE 9(4):e95698.
26. **Besser TE**, Cassirer EF, Highland MA, Wolff P, Justice-Allen A, Mansfield K, Davis MA, Foreyt W. 2013. Bighorn sheep pneumonia: Sorting out the cause of a polymicrobial disease. Preventive Veterinary Medicine 108:85-93.
27. Plowright RK, Manlove K, Cassirer EF, Cross PC, **Besser TE**, Hudson PJ. 2013. Use of exposure history to identify patterns of immunity to pneumonia in bighorn sheep (*Ovis canadensis*). PLoS One. 8(4):e61919.

28. **Besser TE**, Highland M, Baker K, Cassirer EF, Anderson NJ, Ramsey JM, Mansfield K, Bruning DL, Wolff P, Smith JB, Jenks JA. 2012. Causes of pneumonia epizootics among bighorn sheep, Western United States, 2008-2010. *Emerging Infectious Diseases* 18(3):406-14.
29. **Besser TE**, Cassirer EF, Yamada C, Potter KA, Herndon C, Foreyt WJ, Knowles DP, Srikumaran S. 2012. Survival of bighorn sheep (*Ovis canadensis*) commingled with domestic sheep (*Ovis aries*) in the absence of *Mycoplasma ovipneumoniae*. *Journal of Wildlife Diseases* 48(1):168-72.
30. Dassanayake RP, Shanthalingam S, Herndon CN, Subramaniam R, Lawrence PK, Bavananthasivam J, Cassirer EF, Haldorson GJ, Foreyt WJ, Rurangirwa FR, Knowles DP, **Besser TE**, Srikumaran S. *Mycoplasma ovipneumoniae* can predispose bighorn sheep to fatal *Mannheimia haemolytica* pneumonia. *Veterinary Microbiology*. 2010; 145(3-4):354-9. PubMed [journal] PMID: 20466492
31. **Besser TE**, Cassirer EF, Potter KA, VanderSchalie J, Fischer A, Knowles DP, Herndon DR, Rurangirwa FR, Weiser GC, Srikumaran S. 2008. Association of *Mycoplasma ovipneumoniae* infection with population-limiting respiratory disease in free-ranging Rocky Mountain bighorn sheep (*Ovis canadensis canadensis*). *Journal of Clinical Microbiology* 46(2):423-30.

Cumulatively, my 361 research publications that have been cited over 18,000 times by other scientists.

D. Extramural funding for research

Bighorn sheep pneumonia related (2012-2019)

13 grants totaling \$479,000 as Principal investigator

1 grant of \$195,000 as Co-investigator

Other research areas (1990 – 2019)

23 grants totaling \$14,303,000 as Principal investigator

18 grants totaling \$5,651,000 as Co-investigator