

**Modeling the impact of cattle movements on transmission dynamics of bovine tuberculosis  
(*Mycobacterium bovis*) in the United States at local and national scales**

**Final Report**

Colleen Webb and Agricola Odoi

**Public information paragraph**

Bovine tuberculosis (TB) is an infectious chronic disease found primarily in cattle. Despite progress in eradication of bovine TB in the United States, small pockets of infection still exist in cattle and wildlife, and the US spent approximately \$31 million on eradication efforts in 2008 alone. The goal of this working group was to develop network models of cattle movement and the spread of bovine TB in the US that could be used to investigate alternative control and eradication strategies. To meet this challenge, we identified a number of cattle movement and TB datasets at both the state and national levels and assembled a group of experts in network and simulation modeling, bovine TB and control and eradication strategies. The working group developed six successful grant proposals resulting in \$1.6 million in funding from a variety of government agencies in support of this project. A unique dataset on cattle movements in the US was developed and modeled, resulting in the first national scale cattle movement predictions in the US. The movement model is being used to support investigations into the sources and spread of bovine TB. It also serves as a template for similar projects of swine movement. The group has also developed a description of cattle movements in Michigan and linked this to a disease spread model to better understand the impact of wildlife reservoirs on bovine TB in Michigan. The group has also developed new methods for estimating bovine TB prevalence that are being used to better understand the pattern of bovine TB at the national scale. Group members currently have seven papers published and many more in preparation as a direct result of this working group.