

# Survival of *Mycobacterium bovis* during forage ensiling

**D.L. Grooms**, DVM, PhD<sup>1</sup>; **S.R. Bolin**, DVM, PhD<sup>2</sup>; **P Durst**, MS<sup>3</sup>; **A. Lim**, PhD<sup>5</sup>; **R. Smith**, PhD<sup>4</sup>

<sup>1</sup>Department of Large Animal Clinical Sciences, Michigan State University, East Lansing, MI 48824

<sup>2</sup>Department of Pathobiology and Diagnostic Investigation, Michigan State University, East Lansing, MI 48824

<sup>3</sup>Michigan State University Extension, East Lansing, MI 48824

<sup>4</sup>Michigan Department of Agriculture and Rural Development, Lansing, MI 48893

<sup>5</sup>Diagnostic Center for Population and Animal Health, Michigan State University, East Lansing, MI 48824

## Introduction

Understanding potential transmission modes of *Mycobacterium bovis* (MB), the causative agent of bovine tuberculosis, is important for mitigating the risk of cattle herd infections. Cattle feed contaminated by MB from oral secretions of infected wild white tail deer in Northeast Michigan is believed to be a major route of MB transmission to nearby cattle herds. Ensiled feeds are commonly fed to cattle in this region, but it is unknown if MB can survive the ensiling process. The objective of this study was to determine if MB could survive the ensiling process of feedstuffs that are commonly used to feed cattle in Northeast Michigan.

## Materials and Methods

Forages (alfalfa, mixed forage with mostly grass, and whole plant corn) commonly ensiled in Northeast Michigan were harvested from Michigan State University farms using standard practices. Freshly harvested samples were ensiled under laboratory conditions using a vacuum packing system. Prior to ensiling, forages were inoculated with MB. At days 0, 1, 2, 6, 8, 10 or 13, 15, 28, 56 or 66, and 112 (0=immediately after inoculation), samples of forages were analyzed by both liquid (BACTEC) and solid media (Middlebrook 7H11) culture and quantitative real-time PCR. In addition, parallel non-infected control samples were submitted for forage analysis to assess fermentation quality.

## Results

Based on forage analysis profiles, the alfalfa and corn forages underwent acceptable fermentation while the mixed mostly grass was ensiled at too high of a dry matter content and underwent less than optimal fermentation. MB was not cultured nor was the DNA from MB detected in any control samples of ensiled feedstuffs. MB was cultured from all forages immediately after inoculation at the day 0 time point. Subsequently, MB was cultured out to day 2, 28, and 2 for alfalfa, mixed mostly grass, and corn forages respectively. MB DNA was detected by PCR in all ensiled forage at all time points.

## Significance

The inability of MB to be cultured following ensiling suggests the risk of MB contaminated forages serving as source of transmission following ensiling is low. The ability to culture MB in the mixed mostly grass silage for a longer period of time may have reflected the less than optimal fermentation process, and supports fermentation as being detrimental to MB viability. Although MB could not be cultured for an extended period of time, DNA evidence of MB could be detected for the duration of the study. It is unknown if this is DNA that is protected in inactivated bacteria or could represent dormant MB

# Impact of stockmanship training on dairy farms

**U.S. Sorge**, DVM, Dr. med. vet, PhD, DACVPM<sup>1</sup>; **L. Espejo Solovera**, PhD<sup>1</sup>; **A. Stanton**, PhD<sup>2</sup>; **J. Bender**, DVM, MS, DACVPM<sup>1</sup>

<sup>1</sup>Veterinary Population Medicine, University of Minnesota, St. Paul, MN 55105

<sup>2</sup>Department of Dairy Science, University of Wisconsin, Madison, WI 53706

## Introduction

Cattle are handled daily on dairy farms. Cow-human interactions can influence cow-flow and production as well as well-being of cows and their handlers. Our objectives

were to study the stockmanship (low stress cattle handling) knowledge, skills, and behaviors of workers on larger dairy operations and to evaluate the impact on cattle flow and on cattle handling skills.