# Efficacy of Monensin Sodium for the Reduction of Fecal Shedding of *Mycobacterium avium* subsp *paratuberculosis* in Infected Dairy Cattle

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## Introduction

Reducing the quantity of *Mycobacterium avium* subsp *paratuberculosis* (MAP) being shed by cows with Johne's disease should decrease the risk of spread of this disease to young stock. Previous work has suggested that monensin sodium decreases the pathologic lesions associated with Johne's disease, but the impact on shedding of viable MAP remains unknown.

## Materials and Methods

After serologic screening of 32 dairy herds in southwestern Ontario, 233 cows from 13 of these herds were enrolled into a randomized clinical trial. Fecal culture and PCR were used to identify 114 cows as potential fecal shedders, while another 119 cows were enrolled as ELISA-negative, herd and parity-matched controls. All cows were randomized to receive either a monensin controlled-release capsule (CRC) or a placebo capsule. Serial fecal and blood samples were collected for fecal culture and serum ELISA testing over a 98-day period. On day 98 of the study, treatments were switched for all cows continuing in the trial. These remaining cows were followed for another 98-days with a similar sampling protocol. Mixed-effect models were used to measure the impact of treatment on the number of colony forming units (cfu) identified on fecal cultures over time. Cows found to be shedding TNTC (too numerous to count) on the day of treatment were excluded from the analyses as the quantity of MAP in their feces could not be enumerated.

## Results

During the first 98 days of the study, the mean number of cfu cultured per tube from the fecal shedding cows was 2.2. Cows treated with a monensin CRC were found to shed 1.8 cfu per tube less than placebo-treated cows (P=0.08). The serum ELISA S/P ratio was reduced by 1.4 units in cows given monensin (P=0.04). However, treatment with monensin did not reduce the risk of testing positive on fecal culture or serology. Attrition of cattle due to clinical disease and excessive fecal shedding of MAP, limited the statistical power of this study.

## Significance

Monensin sodium administered to infected animals at 335 mg/day marginally reduced fecal shedding of MAP in mature dairy cattle, but the biological significance of this reduction is unknown.