

RESEARCH FACTS



UNIVERSITY OF SASKATCHEWAN

Livestock and Forage
Centre of Excellence

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IN PROGRESS

Delivering a respiratory probiotic to feedlot cattle via feed

PROJECT TITLE

Proof of concept study for the delivery of a respiratory probiotic to feedlot cattle via the feed

In progress:

Results expected in December 2020

RESEARCHERS

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Background:

Mycoplasma bovis is a significant contributor to bovine respiratory disease and polyarthritis (lameness) in feedlot cattle. It is difficult to treat with antimicrobials and there are no efficacious vaccines for preventing *mycoplasma* infections in cattle. Thus, this research is dedicated to finding an alternative method of control, namely, the use of probiotics. Probiotics are live microorganisms that confer a health benefit and, presumably, work by competing for nutritional resources and space to live, and they may even produce chemicals that inhibit pathogens. We are currently investigating a number of potential probiotic candidates. One in particular has been shown to inhibit *M. bovis* growth in the laboratory (*in-vitro* testing). We have also been able to identify a chemical produced by one of our probiotic candidates that inhibits the growth of *mycoplasma* organisms.

In the fall of 2019, we incorporated the probiotic into the ration of feedlot cattle housed at the Livestock and Forage Centre of Excellence. We are now analyzing nasal swabs to determine if the probiotic colonized the nasal passages.

Objectives:

The objective of the study is to demonstrate, using standard microbiological testing, that a probiotic incorporated into the ration will colonize the cattle's nasal passages.

What They Will Do:

The objective of this study was to demonstrate that we can colonize the upper respiratory tract (nasal passages) with a probiotic incorporated into the cattle's ration. If this proof of concept study is successful, then the next phase will involve testing a variety of probiotic candidates to determine if they can reduce the community of *Mycoplasma bovis* that reside in the nasal passages.

In the spring of 2020, six small pens (10 head/pen) at the LFCE feedlot were assigned to three control and three probiotic treatments. Cattle were acclimatized for at least seven days and deep nasal swabs obtained on days 0 (start of sampling), 14 and 28. The probiotic was incorporated into the total ration and fed daily for seven consecutive days. The nasal samples are now being analyzed to determine if the probiotic successfully colonized the nasal passages of the cattle in the treatment (probiotic) pens.

Implications:

Probiotics have been used to improve the gastrointestinal, respiratory and skin health of some animals, including humans, but they have not been used to modulate the bacterial communities found in the nasal passages of cattle. The use of probiotics opens an entirely new avenue for controlling *mycoplasmosis* in feedlot cattle. This is an important consideration because currently antimicrobial therapy is the only viable option to treat *mycoplasmal* infection; however, antimicrobial resistance is becoming increasingly common in pathogens that affect feedlots, hence another non-antimicrobial method of control is needed.

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