



University of
Lethbridge

NEWS RELEASE

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Researchers earn RDAR support to find viable solutions to mitigate Bovine Respiratory Disease

Researchers in the University of Lethbridge’s Southern Alberta Genome Science Centre (SAGSC) and its bioinformatics core are collaborating with scientists at Agriculture and Agri-Food Canada (AAFC) to find viable solutions to mitigate Bovine Respiratory Disease (BRD) — the most prominent feedlot cattle disease in North America — that is responsible for an estimated financial burden of \$3 billion annually.



The supported project is led by ULeithbridge associate professor Dr. Athan Zovoilis and Dr. Tim McAllister, a principal research scientist at AAFC. Zovoilis, SAGSC director and Canada

Research Chair in RNA Bioinformatics and Genomics, Dr. Angeliki Pantazi (SAGSC scientific officer) and Dr. Eric Merzetti (BioNet program manager) are working with McAllister’s team and other scientists at AAFC to advance a genomic-based diagnostic pipeline for BRD, based on Alberta herd-specific pathogens, that will increase the precision of antimicrobial use in the provincial cattle industry.

“To date, no tool exists for the identification of BRD pathogens on a broad scale for Alberta cattle producers and there is a need for province-wide architecture to detect and characterize pathogens of interest in BRD — both in terms of virulence and antimicrobial resistance,” says Zovoilis. “Our labs at SAGSC and AAFC in Lethbridge have already sequenced, analyzed, and characterized a significant number of BRD bacterial isolates.”

Alberta is home to more than 18,000 cattle producers with an estimated 4.5 million cattle, making up 40.4 per cent of Canada’s herd (estimated July 2020). With the highest

cattle population in the country and a heavy reliance of Alberta's economy on exported beef, cattle mortalities pose a significant economic and financial hardship to the province. BRD is responsible for 65-80 per cent of total feedlot morbidities and 45-75 per cent of mortalities.

BRD pathogens are varied with potential origins in multiple bacterial families. Proper treatment of BRD requires pathogen identification. To further add to the difficulty of treatment, antimicrobial resistance (AMR) is of significant concern in these cattle and many of the identified BRD pathogens house resistance to traditional antimicrobial agents used in livestock settings.

"We will take input data from samples sequenced by our next generation sequencing platforms and be able to produce detailed information on BRD pathogens, including relevant AMR," says Zovoilis. "This data will then allow for the precision use of antimicrobial agents, providing better outcomes for cattle and less likelihood of AMR development in the present bacteria."

The project, *A Comprehensive Sequencing and Bioinformatics analysis Pipeline for Bovine Respiratory Disease Pathogens in Alberta Beef Cattle*, is supported by a \$352,000 Results Driven Agriculture Research (RDAR) grant. RDAR and Genome Alberta, with the Government of Canada and Alberta Agriculture, Forestry and Rural Economic Development, announced \$5.1 million in funding through the Canadian Agricultural Partnership (CAP) for agriculture genomics projects earlier this month.

"Genomics research has practical real-world application that is contributing to building a more sustainable agriculture sector in Canada," says Marie-Claude Bibeau, Canada's Minister of Agriculture and Agri-Food. "From developing new tools, improving the quality of food we eat, to breeding more resilient crops — our genomic researchers are the heart of advancing science and innovation so that our farmers in Alberta have the tools they need to be successful."

To view online: <https://www.ulethbridge.ca/unews/article/researchers-earn-rdar-support-find-viable-solutions-mitigate-bovine-respiratory-disease#.YsiYXOzMJFw>

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Contact:

Caroline Zentner, public affairs adviser
University of Lethbridge
403-394-3975 or 403-795-5403 (cell)
caroline.zentner@uleth.ca