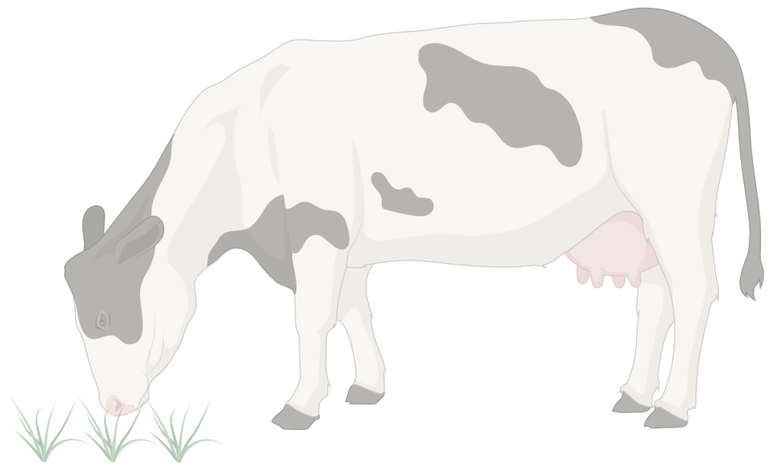
MOSES Organic Farming Conference

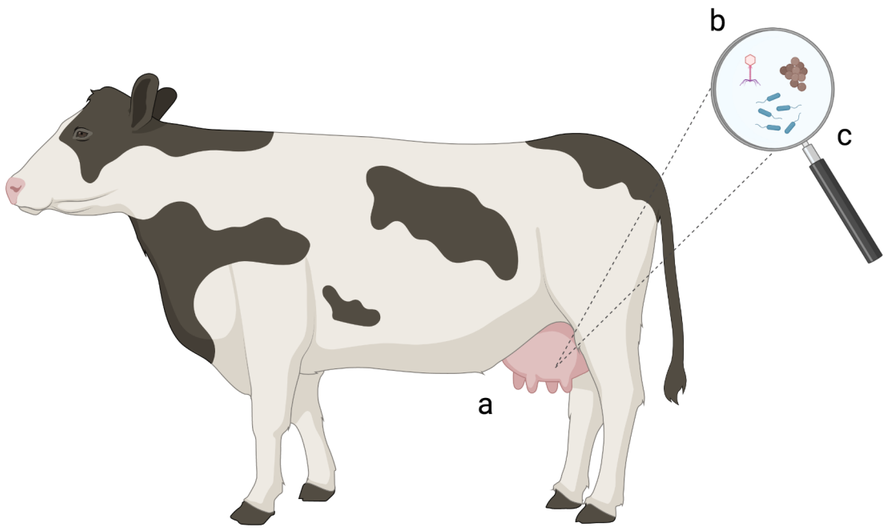


Utilizing the power of the microbiome as an interventional tool for mastitis prevention and treatment in organic livestock production

Research Overview

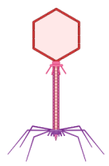
Drs. Noelle Noyes and Luciano Caixeta at the University of Minnesota are developing innovative new strategies to combat one of the most important diseases facing organic livestock producers today: bovine mastitis. Utilizing the power of the microbiome, these researchers are working hard to develop novel, evidence-based, and non-antibiotic solutions for mastitis prevention and treatment.

Schematic representation of the cow udder microbiome

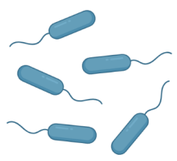


(a) The bovine udder is home to millions of microbes that take up residence within and around the surface of the teat skin.

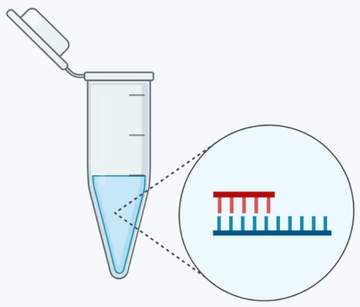
(b) Some of these microbes protect the mammary gland from invasion by major mastitis pathogens.



(c) But sometimes they are not there to accomplish this important task, so the bad microbes are allowed to proliferate.

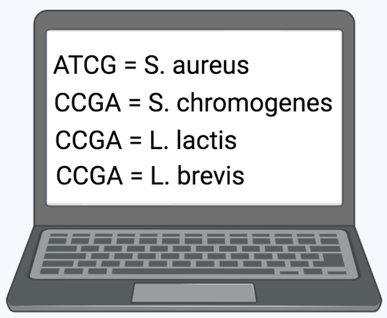


Taxonomic Marker-Gene Sequencing



Similiar to the way that humans can be identified by their **fingerprint**, bacteria and other microorganisms can be identified by their unique **genetic code.**

Their genetic code can be read by **advanced sequencing instruments**, like pages from a book.



Once read, the genetic code can be compared to an existing **genomic database** to determine which microbes are present, what they are doing, and which are beneficial or harmful.

Applications

These results will help identify potential microbial allies against bovine mastitis. Once identified, they can be repurposed into a tool that can be utilized by dairy producers to eliminate and control against new and existing intramammary infections.

Project Timeline

- **2018** — Animal Enrollment
- **2019** — Sample Collection
- **2020** — Laboratory Analysis
- **2021** — Taxonomic Sequencing
- **2022** — Computer Data Analysis
- **2023** — Probiotic Development