Probiotic and enzyme supplements for enhanced livestock feed

Animal feed typically contains a variety of different types of supplements to help livestock digest the feed and remain healthy. These supplements include probiotics and digestive enzymes. Probiotics are live microbial cells that enhance the health and performance of an animal and enzymes are added to help break down feed to release extra energy and nutrients. We are developing new probiotic and enzyme supplements specifically for inclusion in sugarcane bagasse-based livestock feed to add value to this potential low-cost feed ingredient. In this project we are targeting the microbes that naturally exist and thrive in sugarcane bagasse stockpiles as they are already suited to this material. The microbial communities in the bagasse stockpiles vary depending on the oxygen levels, temperatures and pH gradients in the unique ecological niches from the surface to the deeper levels of the piles. Each niche contains microbes that have novel characteristics and enzymes for surviving in each environment. These microbes are thus novel resources for the discovery of feed supplements. Once we have identified bagasse microbes with potential properties for use as bagasse-based feed supplements we will test them in feed.

Benefits for agriculture: Enzyme supplements have an established track record of use in livestock feed leading to significant economic and environmental advantages in animal production. Probiotics are a growing sector of the livestock supplement market. Australian agriculture is set to benefit from this project through improved livestock feed supplements leading to reduced costs as well as better utilisation of bagasse in feed.

Benefits for producers: Sugarcane producers are set to benefit from the outcomes of this project through the increased commercial use of bagasse by-products. This will increase overall revenue for sugarcane producers and increase employment opportunities within the industry.
More information about this project

The use of livestock feed supplements such as probiotics and enzymes has particular significance when using cheaper and more fibrous bulk feed components such as sugarcane bagasse. To maximise supplement performance, it is necessary to identify probiotic strains and enzymes with demonstrated high levels of activity and high stability during both storage and during digestion. The discovery and development of new probiotics and enzymes requires the identification of the best candidates from nature through rapid and high-throughput screening systems, detailed characterisation and production in high-yield, economic and scalable fermentation systems.

The objectives of the project are as follows;

1. To validate and demonstrate a pipeline for the discovery and optimisation of animal feed supplements.
2. To develop the lead targets from objective 1 towards improved performance in specific livestock feed applications.
3. To demonstrate incorporation of new products in active form in animal feed.

Outcomes for industry

- Development of new supplements to enhance the nutritional value of animal feed products
- Development of rapid and efficient technologies for the discovery and optimisation of animal feed supplements
- New income streams for producers