NATIONAL LIVESTOCK METHANE PROGRAM

PROJECT FACT SHEET

Understanding methane microbes in livestock

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About the project

This project is using advanced gene sequencing to better understand the populations of methane-producing microbes that exist in the rumen (stomach) of livestock. This 'genetic blueprint' will be critical knowledge for scientists aiming to reduce methane emissions through strategies that target methane producing microbes and their metabolic pathways.

The project will first deliver a detailed model of microbial populations in 'low' and 'high' methane emitting animals. In other words, identifying the microbes most critical to low methane emissions. It will then pinpoint the functional genes responsible for the growth and persistence of these critical microbes in the rumen. This will assist future research by helping scientists better understand and target the microbes that do most of the methane-related 'work' in the rumen.

Data from this project will be augmented with genetic information of livestock produced by North American, European and New Zealand scientists, helping build a global database of livestock microbe genetics.

What does it mean for producers?

Better knowledge of rumen microbes will help in the selection of 'low emission' livestock that can be incorporated into producer breeding programs. It will also help identify and improve management practices – such as additives or forage selection – aimed at directly reducing methane emission and improving feed conversion.

Data generated from the project may also assist in the development and validation of methodologies that producers may potentially use to claim credits under the Carbon Farming Initiative (CFI) and the future Emissions Reduction Fund (ERF).

Location(s):

The research is being undertaken primarily at CSIRO, St Lucia Qld, with support from AgResearch in Palmerston North NZ and DOE Joint Genome Institute in San Francisco, USA.
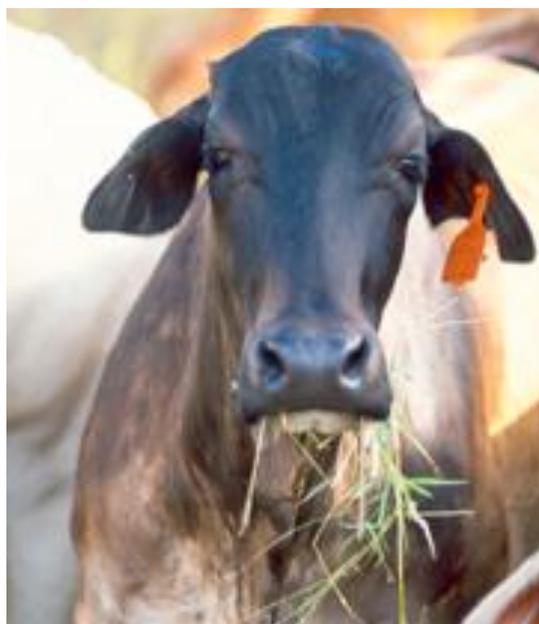
The project will identify microbes associated with feed conversion and nutrient retention and reduced methane emission. Source: CSIRO

BACKGROUND FACTS ABOUT …

The National Livestock Methane Program

The National Livestock Methane Program (NLMP) has been developed to provide producers with practical strategies and tools to help them lower methane emissions while increasing productivity and profitability.

The program consists of 16 research projects grouped into five streams including: measurement of methane, genetics, supplements, forages, and rumen microbiology. These projects commenced in mid-2012 and will run until May 2015.

The NLMP is funded by the Department of Agriculture. It is managed by MLA and receives support from 11 collaborating organisations. For more details on the projects and collaborators, please visit www.mla.com.au

The link between ruminant biology, methane and productivity

When cattle and sheep digest feed, between 2-10 per cent of the feed energy they consume is lost in the form of methane gas. This is caused by the activity of micro-organisms that naturally live in the animals' stomach (rumen) and assist with digestion.

The methane gas (CH_4) is belched out by the animal and into the atmosphere. Simply put, they are 'leaking' feed energy, rather than converting it to muscle. Scientists are working to reduce this loss of feed energy by developing treatments to lower methane emissions. Preliminary research results indicate that some treatments can reduce methane-related energy loss by more than 50 per cent.

Methane is also a potent greenhouse gas and in Australia about 10 per cent of all greenhouse gas emissions and two thirds of agricultural emissions come from methane produced by cattle and sheep. Knowledge and practices aimed at reducing methane emissions from livestock therefore serve the dual purpose of improving feed efficiency, productivity and farm income, while also helping lower Australia's greenhouse gas emissions.