Australian red meat industry stakes a claim for a carbon neutral future

August 9 2023, by Jane Nicholls

Hereford cattle are one of the main breed of cattle grown in Australia. Can we eliminate their methane emissions? Credit: Pixabay/CC0 Public Domain

Increasing environmental awareness among consumers presents a challenge to improve practices. It's also an opportunity to reap the rewards of doing so.

As demand for sustainable food grows, so are expectations that a product's claimed credentials are trusted and verifiable.

The Australian red meat industry, led by its peak body Meat & Livestock Australia (MLA), has set a bold target to be carbon neutral by 2030 (CN2030). MLA also has a goal to double the value of Australian red meat sales in the exact same timeframe.

Those twin aims might seem mathematically improbable, but CSIRO analysis shows that the industry is already on track. Since 2005, greenhouse gas emissions (GHG) from the Australian red meat industry have fallen by 59%.

Between 2005 and 2019, according to CSIRO's modeling, the sector's contributions to the nation's emissions more than halved, from 22% down to 10.7%.

New CSIRO modeling shows that of Australia's average annual red meat sector greenhouse gas emissions, 49% are from cattle, 6% are from sheep meat, and less than 1% is contributed by goats.

Most of those emissions are enteric methane, the gas exhaled—or burped—by ruminant animals as a natural part of their digestion.

Tackling a meaty challenge together

"CSIRO and MLA have overlapping desires to support agriculture and help exports grow," Ian Jenson, a food scientist and manager of Market Access Science and Technology at MLA, says.

"These are difficult problems where we can combine our respective expertise to either develop, or apply existing, technologies to solve them," Dr. Jenson says.

Beef producers have taken the lead by deploying a whole suite of emissions-reduction strategies. They include reducing land clearing and sequestering carbon through planting trees, soil management, breeding and managing herds and flocks for more efficient growth and innovations to feed and grazing practices that reduce those enteric methane emissions.

CSIRO and MLA are also working on developing a digital-assurance system that will give producers access to high-value markets and premium prices as a direct benefit of their carbon-neutral credentials.

"MLA wants to bring our whole industry along and give them the ability to do this," Dr. Jenson says.

"Planting trees and ground cover is important, but it goes beyond that. CSIRO has done a lot of work over the years in this area and has excellent models and innovations, and that's why we're working with them.

"We really appreciate CSIRO for being the 'worker-outer' of hard problems, and the scientific umpire as to what's important."

Science can squelch the belch

"We've linked in with MLA on R&D for emissions reduction because it's one of the strategic targets for CSIRO's Towards Net Zero mission," Dr. Sonja Dominik, CSIRO Research Director for Livestock and Aquaculture says.

"We're working on some of the technologies that will be key to helping the red meat industry achieve carbon neutrality."

One of the promising scientific innovations coming online at scale are feed supplements that reduce those enteric methane emissions in feedlot herds. FutureFeed is one that was developed by CSIRO in partnership with MLA and James Cook University and became commercially available this year through CH4Global.

"FutureFeed came out of research from CSIRO that red algae can reduce methane emissions by up to 80%, and there are other products becoming available too."

Asparagopsis seaweed inhibits a key step in methane production, leading to a huge reduction in the methane produced and released via burps.

"The application of supplements in feedlot systems is relatively straightforward—you just mix it in with the feed and you have control of the dose," Dr. Dominik says.

Solutions for grazing livestock

The challenge is that the majority of the Australian cattle herd grazes on pasture.

"Particularly in the extensive cattle stations in the north, there's much less control and monitoring possible," Dr. Dominik says.

MLA is funding CSIRO research into how to overcome that challenge.

"We're doing research into pasture species," says Dr. Dominik. "There are legume fodder crops, such as Desmanthus and Leucaena, that have been tested for those properties in the north. These are not supplements

but can be planted into tropical pastures to become part of the diet of grazing animals."

Further research is under way on the emissions-reduction benefits of these legumes, which would encourage pastoralists running herds in remote locations to include legumes as an important step towards carbon neutrality.

CSIRO research in Perth has also evaluated a number of native shrubs including Eremophila and Rhagodia which reduce methane in vitro.

Genetics can grow a carbon-friendly herd

Farmers know their herds better than anyone, but with the assistance of science farmers will have tools for selection and management to lower methane production and for animals to also grow more efficiently.

"We are continually researching breeding to improve the efficiency of how animals grow which is directly related to lower methane emissions," Dr. Dominik says.

"You are trying to produce more with less. For example, animals that require a lower feed intake to produce the same amount of meat are desirable, because the more an animal eats, the more methane it produces."

It's a huge effort, with a lot of support. "Farmers really want to know how they contribute to and meet the target," Dr. Dominik says.

"The technologies we are developing will help them do so, but of course come at a price. To ensure implementation in their farming systems requires information, but importantly we need to keep our eyes on ensuring that businesses remain profitable."

Verifying what's on your plate is carbon credentialled, and worth more

This is the crux of the CSIRO, MLA and Department of Agriculture, Fisheries and Forestry partnership in the Trusted Agrifood Exports Mission.

As farmers move to carbon-neutral operations, how do they realize a return that rewards them for that? Verification, credentialing and digital traceability are all in play and among the initiatives that CSIRO and MLA are pursuing.

Dr. Jenson is working on developing how MLA can best communicate those credentials.

"You've got to not only do the right thing, but you've got to be able to show consumers that the meat has been raised in the way they expect, whether that's carbon-neutral credentials or animal welfare. There's no doubt it's becoming more important."

The Environmental Credentials for grass-fed beef platform pilot is currently underway. MLA is leading a consortium with the World Wildlife Fund and The University of Queensland as partners, and the pilot will conclude in June 2023. The aim is to develop an online tool, accessible to all grass-fed beef producers wanting to measure and demonstrate their environmentally sustainable production practices.

MLA and CSIRO are also working on setting the standards.

"CSIRO is helping us to understand what credentials are important and how they can be measured," Dr. Jenson says.

"Working that out scientifically is vital because what we absolutely don't want is a meaningless sticker on a pack. We need stringent, end-to-end supply-chain verification."

A key plank is a robust database to underpin the verification for labeling.

"The Trusted Agrifood Exports Mission is working on new digitals tools to provide an evidence base for important credentials along supply chains," Dr. Dominik says.

"That will mean that when it arrives on your plate, you can be sure that this meat was truly produced in a carbon-neutral way, because the data that underpins the credentials has been passed through the supply chain."

A difficult but surmountable challenge?

Multiple points in production make traceability in the red meat supply chain difficult—but nothing is impossible with science.

"The Trusted Agrifood Exports Mission is working on ways to identify individual animals with information once they have gone through the abattoir," she explains.

"We've looked into genomics—like forensic DNA technology where the genetic material can be traced back."

Isotopic or geochemical fingerprinting is another approach.

"Chemical markers in animals and the environment enable you to trace back to its origin," Dr. Dominik says.

"We like to call these isotope and geochemical marker profiles 'fingerprints.'

"Geochemical fingerprints of the environment an animal was grown in are found in the meat product, and can be traced back to the point of origin.

"The Trusted Agrifood Export Mission is investigating how to implement that by building a national provenance database."

For MLA and its producers, this is mission critical.

"Scientifically it is really interesting—the key is going to be how to make it valuable," Dr. Jenson says.

"Consumers around the world already trust the quality and safety of our products.

"Environmental credentials are increasingly important to being successful on the world market and getting the price premium our products deserve."

Provided by CSIRO

Citation: Australian red meat industry stakes a claim for a carbon neutral future (2023, August 9) retrieved 29 April 2024 from https://phys.org/news/2023-08-australian-red-meat-industry-stakes.html