

COULD FARMERS AND SEAWEED SOLVE THE CLIMATE CRISIS?

THE CLIMATE CRISIS IS REAL AND MORE URGENT THAN MOST OF US THINK BUT LIVESTOCK FARMERS COULD HELP STAVE OFF ITS WORST EFFECTS SAYS A US-BASED AUSTRALIAN SCIENTIST AND ENTREPRENEUR.

This is because a seaweed native to Australia and New Zealand could reduce the amount of methane ruminant animals produce by as much as 90 percent.

Dr Steve Meller is CEO of CH₄ Global, a company focused on globally scaling the commercial production, processing and distribution of the red seaweed *Asparagopsis* to lessen climate change.

There are two species of the seaweed. *Asparagopsis armata* is native to the cold waters of the southern Pacific, whilst *Asparagopsis taxiformis* grows in temperate and tropical regions of the Pacific and Indian oceans.

Both species have the ability to nearly eliminate the production of methane when fed to cows as a supplement.

Given that there are 1.5 billion cows on the planet, if only a relatively small percentage of them stopped producing methane, it could make a significant change in the future of the world's climate.

What is more, the business model CH₄ Global has developed will enable farmers to profit from the use of *Asparagopsis* in several ways.

"Climate change is the greatest challenge humanity faces. Our global production of greenhouse gases is not going backwards, which means we are going to see more intense and more frequent extreme weather events," Steve says.

"Even if all the countries in the world met their commitments made at the UN's 2015 climate conference in Paris, we would only reduce the amount of carbon dioxide entering the atmosphere by about 10 gigatonnes per year.

"But the UN notes in its annual Emissions Gap Report, we would

still have a significant gap of 13 gigatonnes in annual global emissions that we would have to stop producing over the next decade if we are to stay on a path to limit global warming to 2° by 2100.

"While most of the talk has been on reducing the use of fossil fuels and CO₂, the UN stated in a pivotal report in May, 2021, that methane is the single largest lever to impact climate change over the next 25 years."

This is because methane is 86 times more potent than CO₂ over a 20-year period. There are two main ways humans produce methane – fossil fuels and agriculture.

"Cows produce 70-120 kg of methane per year," Steve says. "If the average is 100 kg, and you multiply that by the world's 1.5 billion cows and take into account the impact of methane over 20 years, you come up with cows producing 12.9 gigatonnes of CO₂ equivalent every single year.

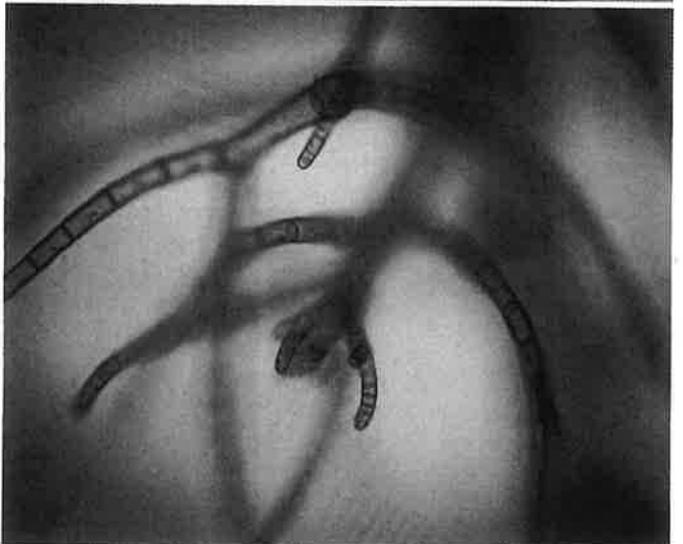
"This would bridge the gap we need to fill. It is more than the 11.7 gigatonnes of greenhouse gases that China produces each year, and they are the world's largest emitter. It is also more than the combined greenhouse gases produced by the next three largest emitters, the USA, the EU and India."

Steve says work is underway on a number of other ways to reduce methane produced by burping cows. These include vaccines, breeding, synthetic chemicals, probiotics and other various feed supplements.

Published data shows that these approaches reduce methane from cows by just 5-30 percent, however. This is significantly less than the 90+ percent reduction *Asparagopsis* achieves.

ASPARAGOPSIS AND FARMERS

The ability *Asparagopsis* has to suppress methane production during the digestion process was worked out by researchers at Australia's CSIRO, who collaborated with scientists at James



Cook University in Townsville and Meat & Livestock Australia.

These parties own the intellectual property on the use of *Asparagopsis* for methane reduction and for feed efficiency. In 2020, they established FutureFeed to license that intellectual property to companies to commercialise *Asparagopsis*.

CH₄ Global was the first company in the world to take on a license from FutureFeed. It has since learned how best to grow the seaweed in commercial quantities and how to process it while retaining its methane-busting qualities.

The intellectual property on growing, hatchery design, processing and formulation of *Asparagopsis* is the property of CH₄ Global.

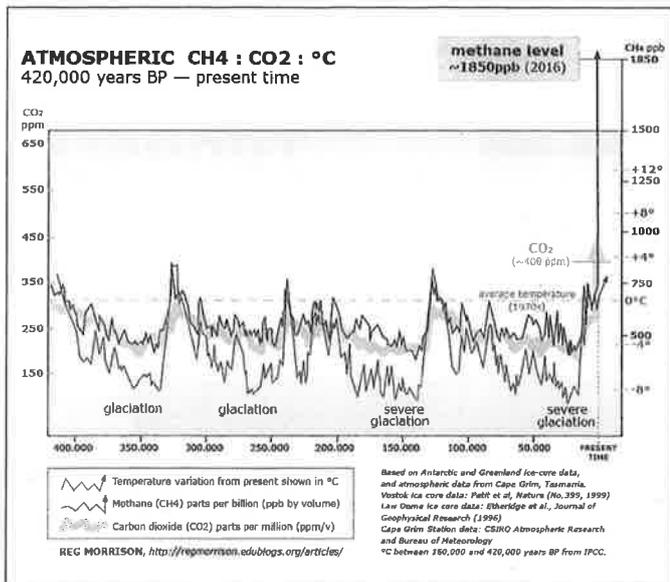
"I was in New Zealand, when my co-founders and I decided to set up the company. When

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TOP: ASPARAGOPSIS IS A RED SEAWEED THAT CAN NEARLY STOP THE PRODUCTION OF METHANE IN RUMINANTS WHEN FED AS A SUPPLEMENT THAT MAKES UP LESS THAN ONE PERCENT OF THEIR DIET.

ABOVE: CH₄ GLOBAL HAS DEVELOPED A PROCESSING SYSTEM THAT PRESERVES THE ACTIVE INGREDIENT IN ASPARAGOPSIS (BROMOFORM) THAT DISRUPTS METHANE PRODUCTION.

we did, we set ourselves three goals," Steve says.

"One is to act with urgency. Another is to put money in farmers' pockets. Three of the co-founders are Maori, so our third pledge is to work with ▶



STUDIES SHOW THAT THE LEVEL OF METHANE IN THE ATMOSPHERE MIRRORS GLOBAL TEMPERATURES AND IT IS CURRENTLY JUMPING TO EXTREMELY HIGH LEVELS.

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4) The fourth benefit is the increased value farmers can claim by being low carbon producers. As with organic products, consumers who want low-carbon products are prepared to pay a premium.

The other side of this coin (and a potential fifth benefit) is that, by reducing their methane output, farmers could avoid taxes on carbon that Steve predicts are on the horizon. He says the next round of UN's climate change talks – COP26, which will be held in Glasgow in November – is likely to see pressure come on producers to cover some of the social cost of the carbon they create.

CH₄ GLOBAL

One of the messages Steve wants to get across to farmers is that this is not theoretical mumbo jumbo about work taking place in laboratories. CH₄ Global has reached the stage where it is beginning commercial production of *Asparagopsis*.

The seaweed is grown on lines, much like farmed mussels, making it a good companion crop for mussel farmers. It can also be grown in large tanks.

“We have built a market demonstration scale facility in South Australia that can produce 8-10 tonnes of dried *Asparagopsis*

per year. This is a functioning facility with *Asparagopsis* growing in hundreds of litres of tanks, thousands of litres of ponds and 10 km of lines in the water.

“We will supply pre-commercial product later in 2021 to key collaborators and we will be scaling up to market production in mid-to-late 2022.

“We have the licenses and regulatory approval needed to sell immediately in Australia as well as the space needed for commercial scale. We are working with regulators in New Zealand on approval there.”

Once the commercial model has been proven, CH₄ Global will take its growing and processing systems to other parts of the world.

Under contract to CH₄ Global, New Zealand's National Institute of Water and Atmospheric Research (NIWA) did some of the research that led to the commercial scale aquaculture of *Asparagopsis*

The other tricky part of making a product for animal consumption is processing the seaweed without removing the active ingredient (bromoform) that disrupts methane production. CH₄ Global has developed the process, which takes up to 12 steps and retains the seaweed as a natural product.

CH₄ Global believes it can help take the response to global climate change to the next level. In New Zealand, *Asparagopsis* could play a big part in achieving net carbon zero.

“Something is needed quickly in New Zealand, as it is one of only a handful of countries whose emissions have increased over the last decade, largely due to increases in the number of cows,” Steve says.

“In light of the report that the Intergovernmental Panel on Climate Change released in August, it is critical to address climate change with urgency in New Zealand and to have agriculture technology front and centre.”

For further information check out the CH₄ Global website. **RC**

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FOR COMMERCIAL PRODUCTION, ASPARAGOPSIS CAN BE GROWN IN TANKS, PONDS OR ON LINES IN THE SEA, SIMILAR TO MUSSELS.

indigenous people, which we are doing in both Australia and New Zealand.”

CH₄ Global processes *Asparagopsis* into a powder that is added to the cow's diet at a low rate (less than on half of one percent of the diet). CH₄ Global is developing specific formulations for beef feedlots, the dairy sector and free-range cows.

Each of these is different but can reduce methane and increase productivity while being consistent with farmers' current habits and practices.

So what do farmers get out of using the seaweed other than knowing they are helping the planet? Steve says farmers gain financial returns in four ways.

1) The first is through a rebate from CH₄ Global to acquire the carbon credits at market rates that farmers might earn by reducing the methane from their animals.

“Farmers could try to get a price for the carbon equivalent of their methane reductions, but these markets are not yet functional. Part of our business model is to aggregate these credits, so we will pay a rebate to our customers as soon as they start using our product.”

2) Secondly, published studies show that *Asparagopsis* gives a ‘feed efficiency benefit’. By reducing methane production, cows become more efficient because more free fatty acids are available to provide energy to the cow.

“This means the farmer using *Asparagopsis* will likely get more milk or meat from the same amount of feed, or gets the same amount of production with less feed.”

3) Thirdly, seaweed has micronutrients, vitamins and minerals that are beneficial to ruminant animals.

