

CH4 GLOBAL
Zero Methane Agriculture

Asparagopsis Science Update

NZ Agricultural Climate Change Conference – March 1st 2023

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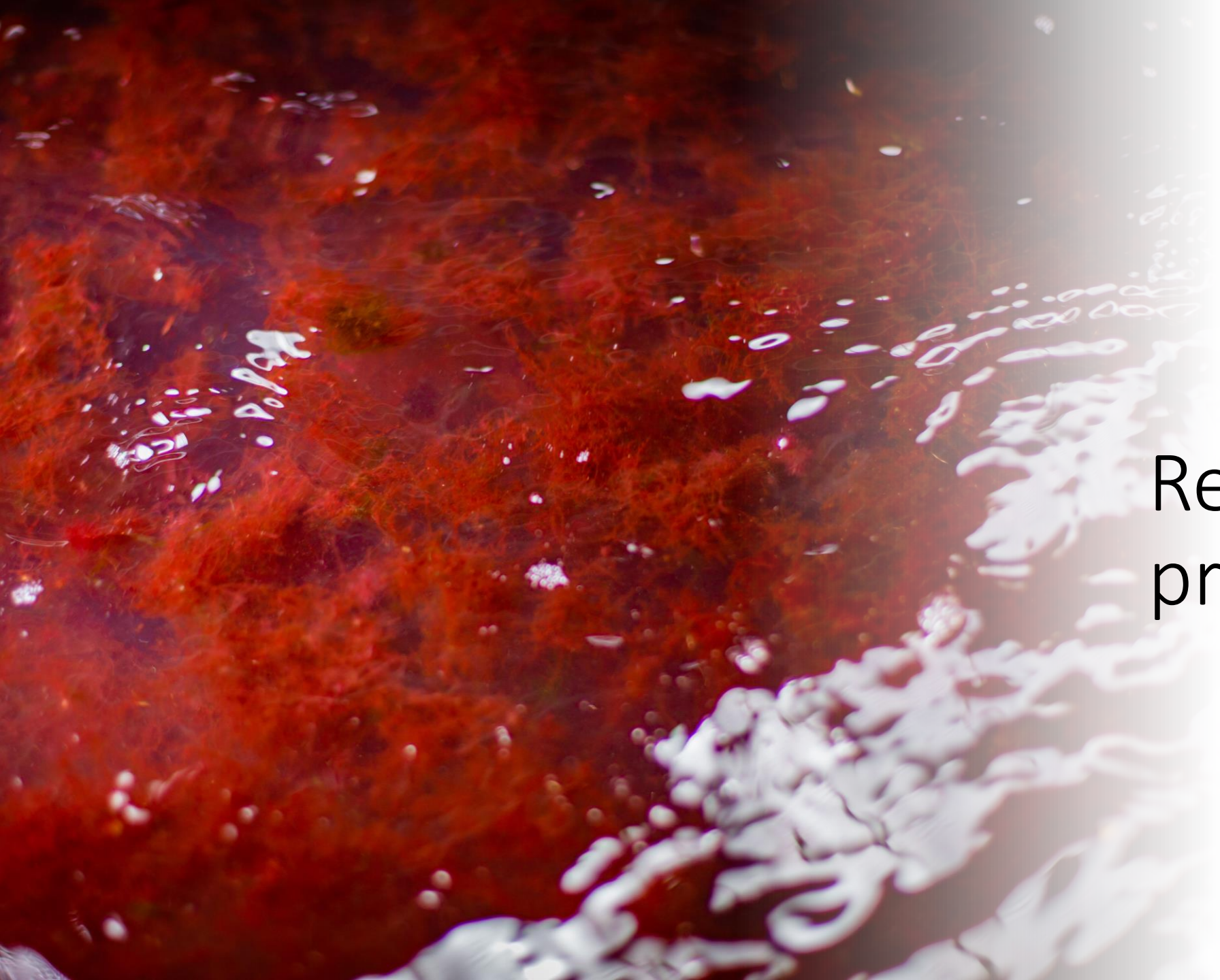
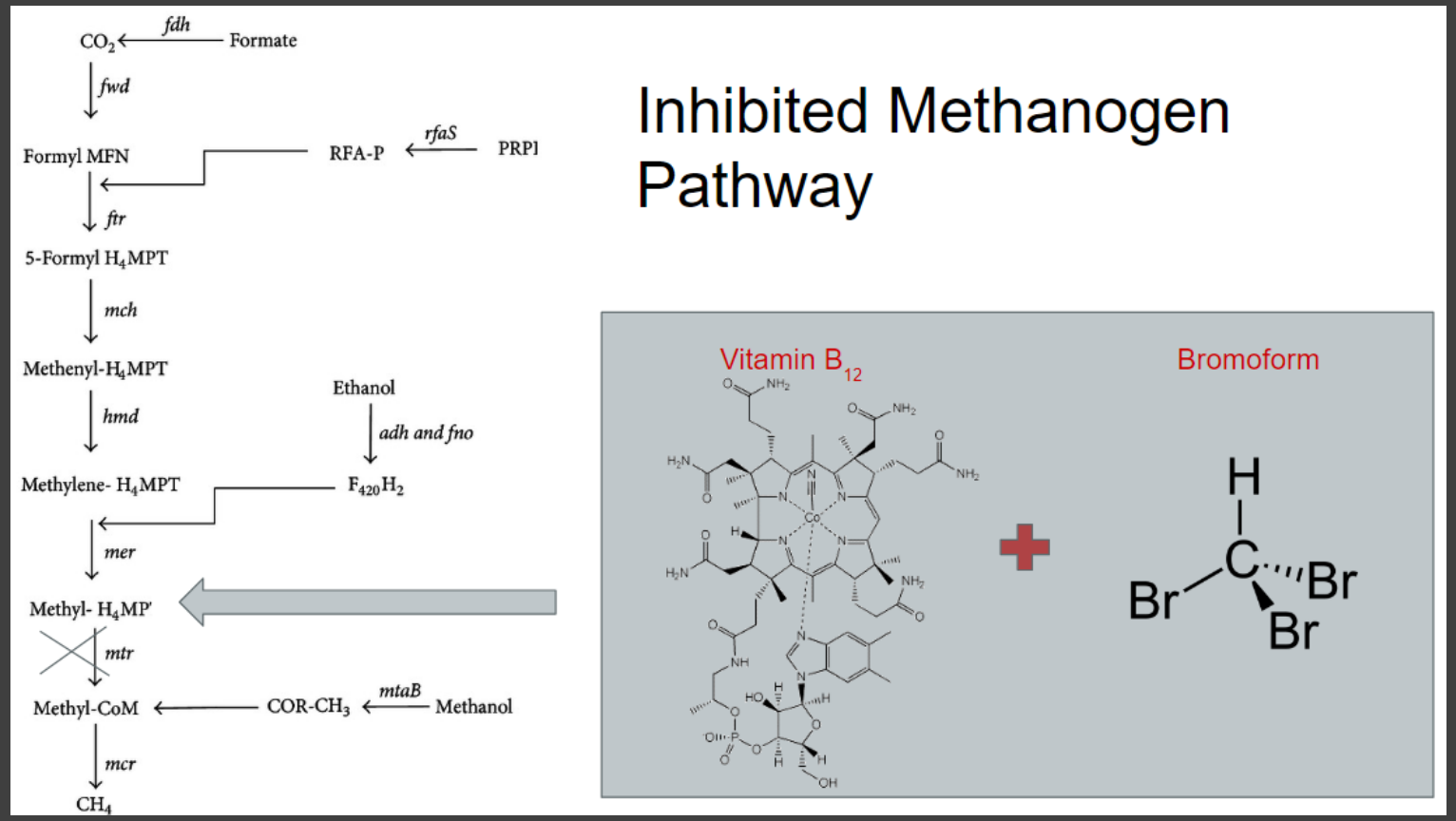


Recap 2021 presentation



Asparagopsis reduces enteric methane

- Red seaweed, low inclusion rates, large methane reduction
- Brominated compounds inhibit methanogen metabolism


Effective and safe in multiple trials

Best practices

High quality seaweed
Low inclusion rates
Palatable supplement

Best results

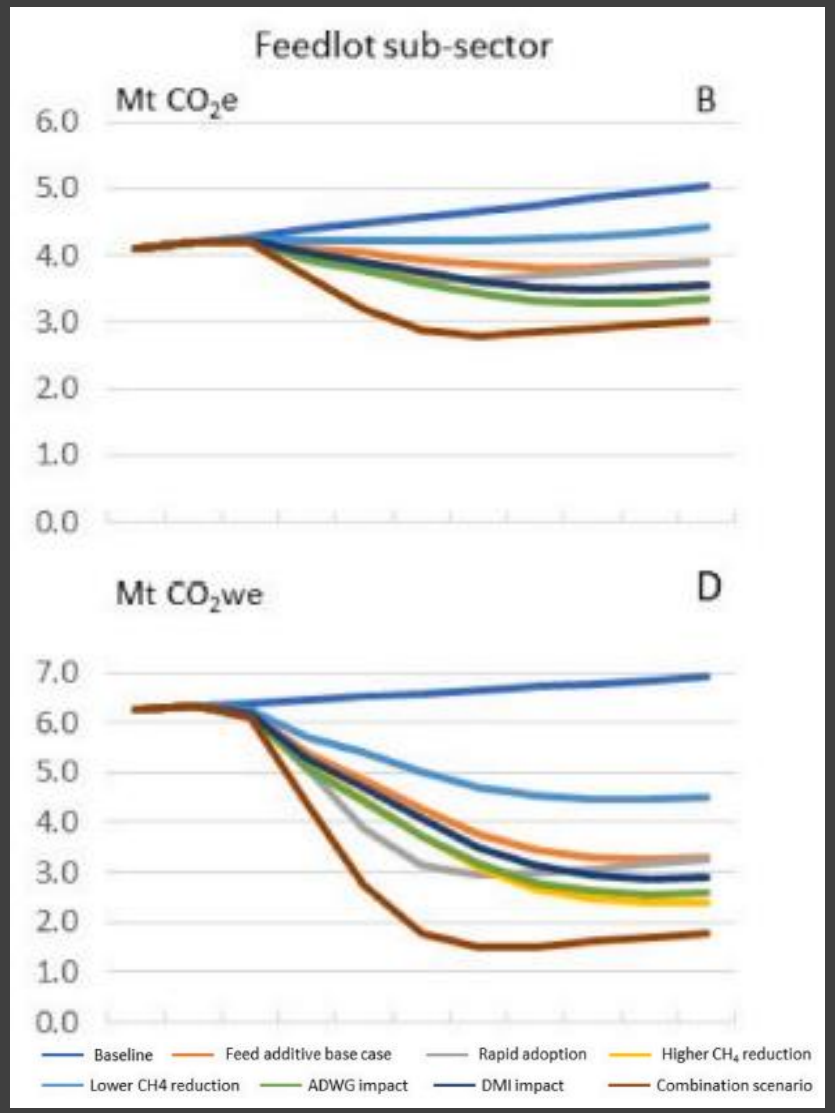
Strong methane reduction
Improved productivity
No safety/health issues

70+ Publications Since 2021

- 13 studies on composition/chemistry
- 12 reviews or meta-analyses
- 11 papers on production/aquaculture/processing
- 11 papers on ecology/natural history
- 9 studies on non-ruminant applications
- 8 feed trials
- 5 in vitro/in silico rumen studies
- 3 omics studies
- 2 modelling of impacts at large scale application
- Patents on varieties/culturing/formulation/delivery

Key conclusions of this science

- SAFE
  - No residues or animal health effects noted from seaweed supplementation (multiple studies)
  - No impact to ozone layer from mass-scale cultivation (Jia et al, Atmos.Chem.Phys. 22, 7631, 2022)
- EFFECTIVE
  - Consistent, strong methane reduction (multiple studies)
- BENEFICIAL
  - Addressing global dairy herd = $5B in savings, -50% methane (International Food Policy Research Institute https://doi.org/10.2499/p15738coll2.135065)



Ridoutt et al. J. Clean Prod. 337, 130499, 2022

Pulsed Oil Supplementation

- Lactating dairy cows fed twice daily with oil-extracted Asparagopsis
- Pulsed supplementation reduced methane ~50%, but regime can be further optimized.
- Supports previous evidence that there's a broad-spectrum action from Asp.
- Elevated bromoform in milk, but still below levels of concern

Scalability

- Optimized tank-based production
- Exceptional productivity
  - 10% growth/d
  - 2-3x quality of research product
- Ecopark development underway
  - 15,000 cattle/d -> 60,000 cows/d
- Aggressive global scale plans
  - 10M by 2025/6, 150M by 2030

Ecopark plans take shape

Environment

Che Baker

Construction of a multimillion-dollar ecopark in Bluff, that will cultivate seaweed into a supplement to reduce the methane produced by cows, will begin in October.

CH4 Aotearoa is about to start construction of its first ecopark to cultivate a New Zealand-native seaweed, asparagopsis armarta, for its methane reduction animal supplements.

The seaweed sector globally is thought to be a US$14 billion (NZ$22.6b) industry.

The CH4 Aotearoa facility at Ocean Beach will be built in two phases, with phase one being commissioned by the end of this year and reaching full production by the middle of 2023.

CH4 Aotearoa general manager Nigel Little said the initial ecopark will employ about 10 full-time staff with many more local jobs likely to be generated during the next five years.

The Ocean Beach site enables company to expand to be 10 s bigger.

e company estimated the ealand industry could be 00 million in the next rs or more than $1b by

rk, a full scale land ture farm, uses loped at CH4 lity based at quaculture

pany m-

An artist's impression of the front of the building housing the ecopark being built at Ocean Beach near Bluff.

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Plans for the Ocean Beach NZ aquaculture centre, detailing where the restaurant and bar, future tourist accommodation and galleries will be located.

Little said it will be the first of many ecoparks planned during next five years as it scales up ble to support 1 million

has contracted design and th con-

the start of October.

Most of the seaweed will be exported to Australia for use within the feedlot cattle market.

Ocean Beach NZ managing director Blair Wolfgram said "we are very excited about our partnership with the CH4 Global team that has gone from strength to strength over the last couple of challenging years".

"CH4 have a strong alignment with Ocean Beach's aspiration to be an Aquaculture Centre of Excellence and will be a significant contributor with our other partners to growing aquaculture indus-

Murihiku/Southland."

Ocean Beach NZ first pur chased about 50 hectares of land near Bluff in October 2018, devel oping its subsidiary New Zealand Abalone Company's (NZAC) pāua farm in 2019.

In January, Wolfgram said s far $10m had been invested int the site, which currently houses a pāua farm, with a further $4m t $5m expected to be invested in the next two years.

The investment will result i the pāua farms' interior being remodelled and New Zealand only commercial whitebait fa Māniaki Whitebait, movin the site from its W location north of Au

Planning is al an artisan foo the site.

Th

Conclusions

- Proven efficacy – 90% methane reduction for continuous feeding systems
- Proven safety – for animals, people and planet
- Large body of science, continually evolving
- Progressing a once-a-day solution for dairy
- Scalable – targeting 150,000,000 cows by 2030