CH4 GLOBAL
Zero Methane Agriculture

Carbon, Cows and Collaboration

Commercialising the key to global emissions reduction

CH4 GLOBAL SNAPSHOT

COMMERCIALISING THE KEY TO GLOBAL EMISSIONS REDUCTION

CH4 GLOBAL
Zero Methane Agriculture

CH4 Global is commercialising Asparagopsis as a natural animal feed supplement product to reduce livestock emissions globally by up to 90%

CH4 Global is solving the key technical barriers and is at a commercial tipping point leading to a global rollout

“…CUTTING METHANE IS THE STRONGEST LEVER WE HAVE TO SLOW CLIMATE CHANGE OVER THE NEXT 25 YEARS”

April 18, 2021

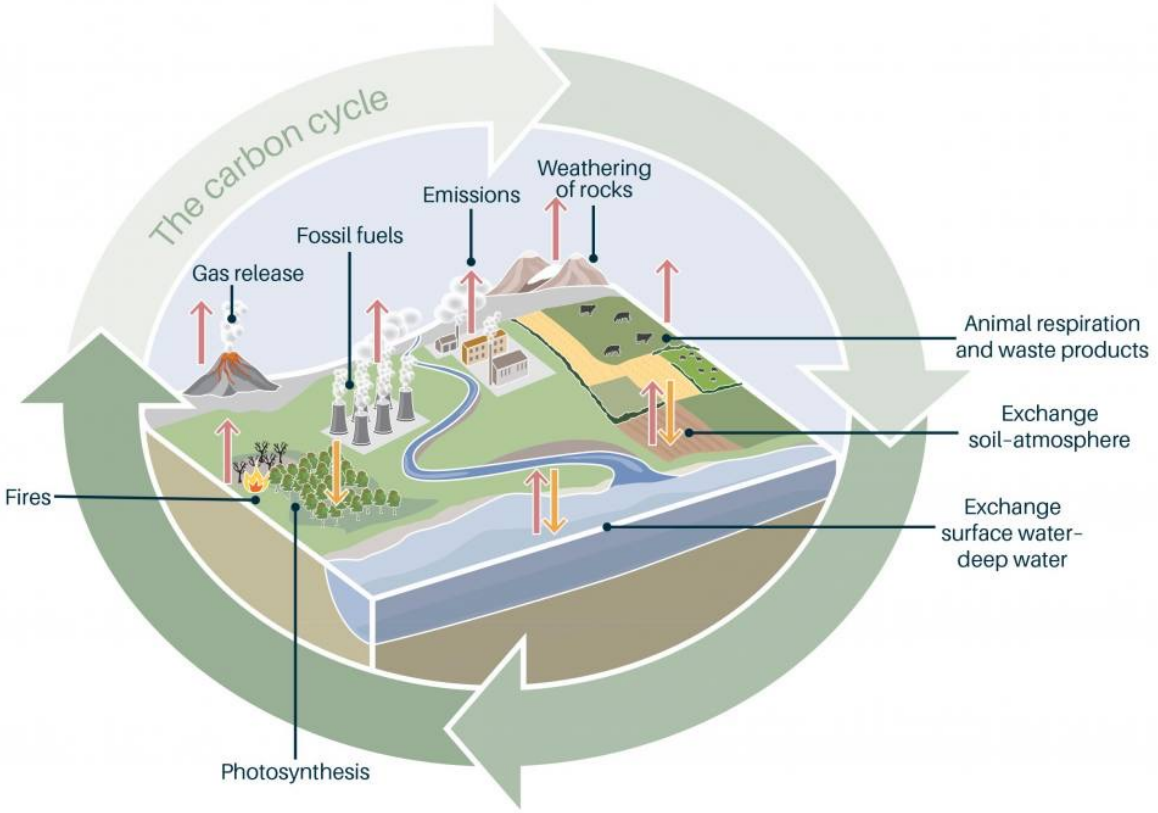
Inger Andersen, Executive Director of the United Nations Environment Program

Drew Shindell, Nicholas Professor of Earth Sciences at Duke University and Chair of the Climate and Clean Air Coalition’s Scientific Advisory Panel

https://thehill.com/opinion/energy-environment/548753-our-best-shot-to-slow-climate-change-now-cut-methane

CARBON CONUNDRUM

CARBON- ON THE MOVE IN A CLOSED LOOP



The amount of carbon we have on Earth doesn't change.

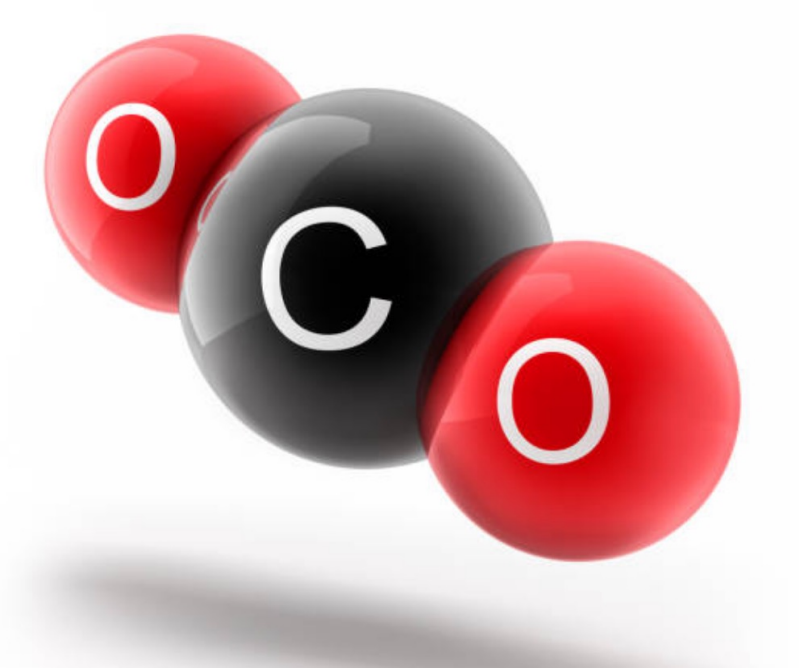
Carbon is a crucial element for all life on Earth.

Carbon is the basic building block of life and helps form the bodies of living organisms.

There is a continuous two-way flow of carbon between the organic and inorganic forms.

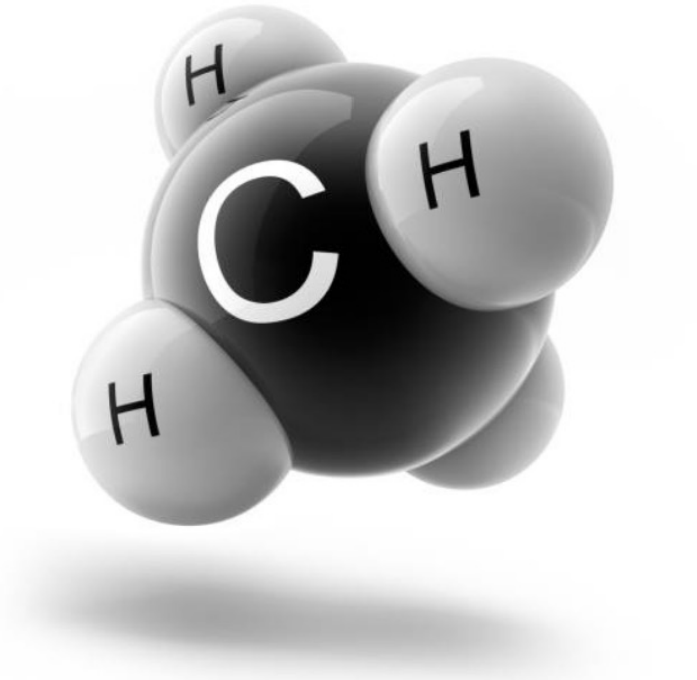
Unfortunately the balance sheet is looking grim

ITS GETTING HOT IN HERE



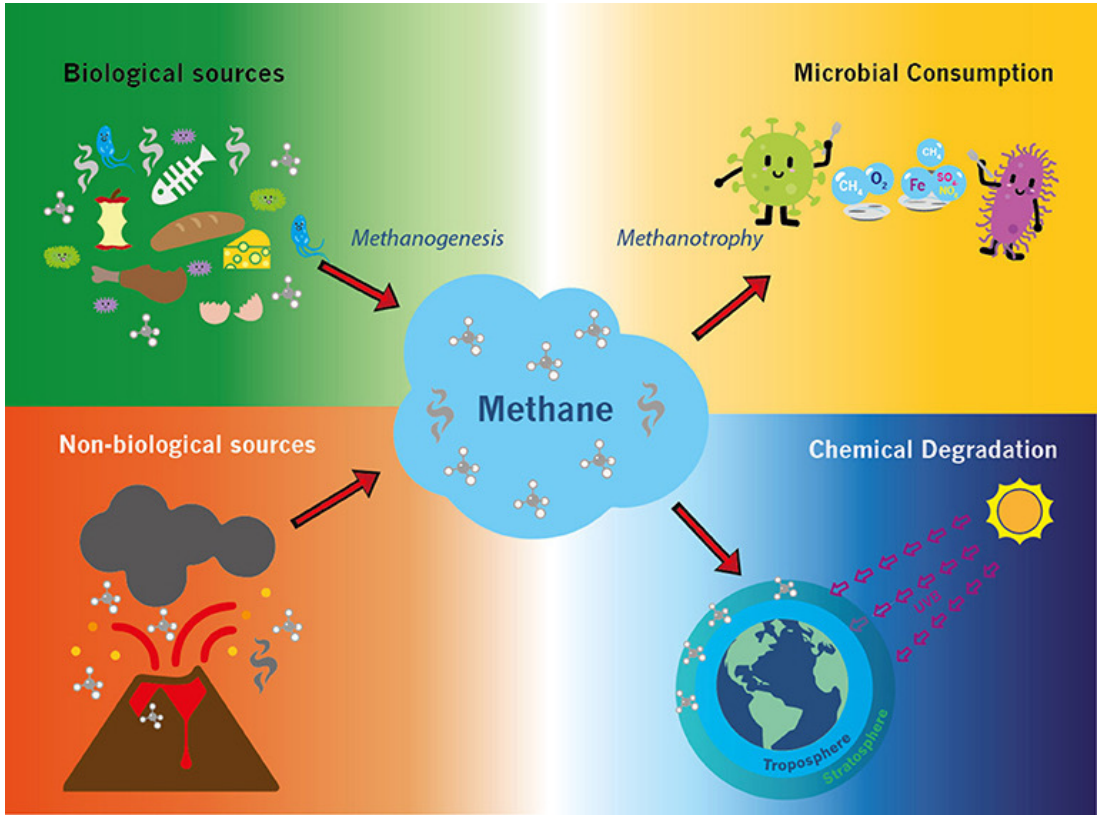
Greenhouse gases are the gases in the Earth's atmosphere that produce the greenhouse effect.

Most greenhouse gases can have either a natural or an anthropogenic source.



In order to compare the respective impact on the climate and the warming potential of the greenhouse gases, methane and nitrous oxide are measured in CO_2 equivalents (CO_2e).

METHANE- WHERE HAVE YOU BEEN HID



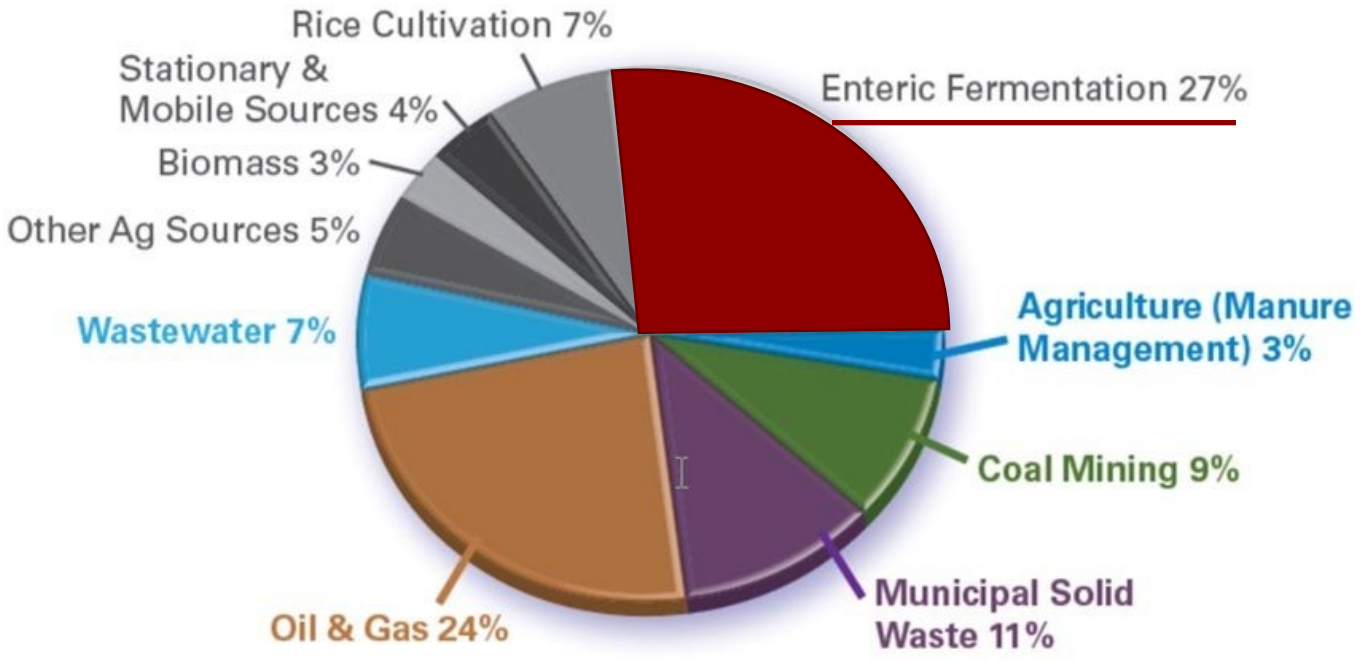
Methane is the **second most** abundant anthropogenic GHG after carbon dioxide (CO_2), accounting for about 20 percent of global emissions.

Methane is more than **25 times as potent** as carbon dioxide at trapping heat in the atmosphere.

Because methane is both a powerful greenhouse gas and short-lived compared to carbon dioxide, achieving significant reductions would have a **rapid** and **significant** effect on atmospheric warming potential.

COUNTING COWS

CATTLE ARE THE LARGEST SOURCE OF ANTHROPOGENIC METHANE GLOBALLY



Wang et. al. (2020) Scientific Reports

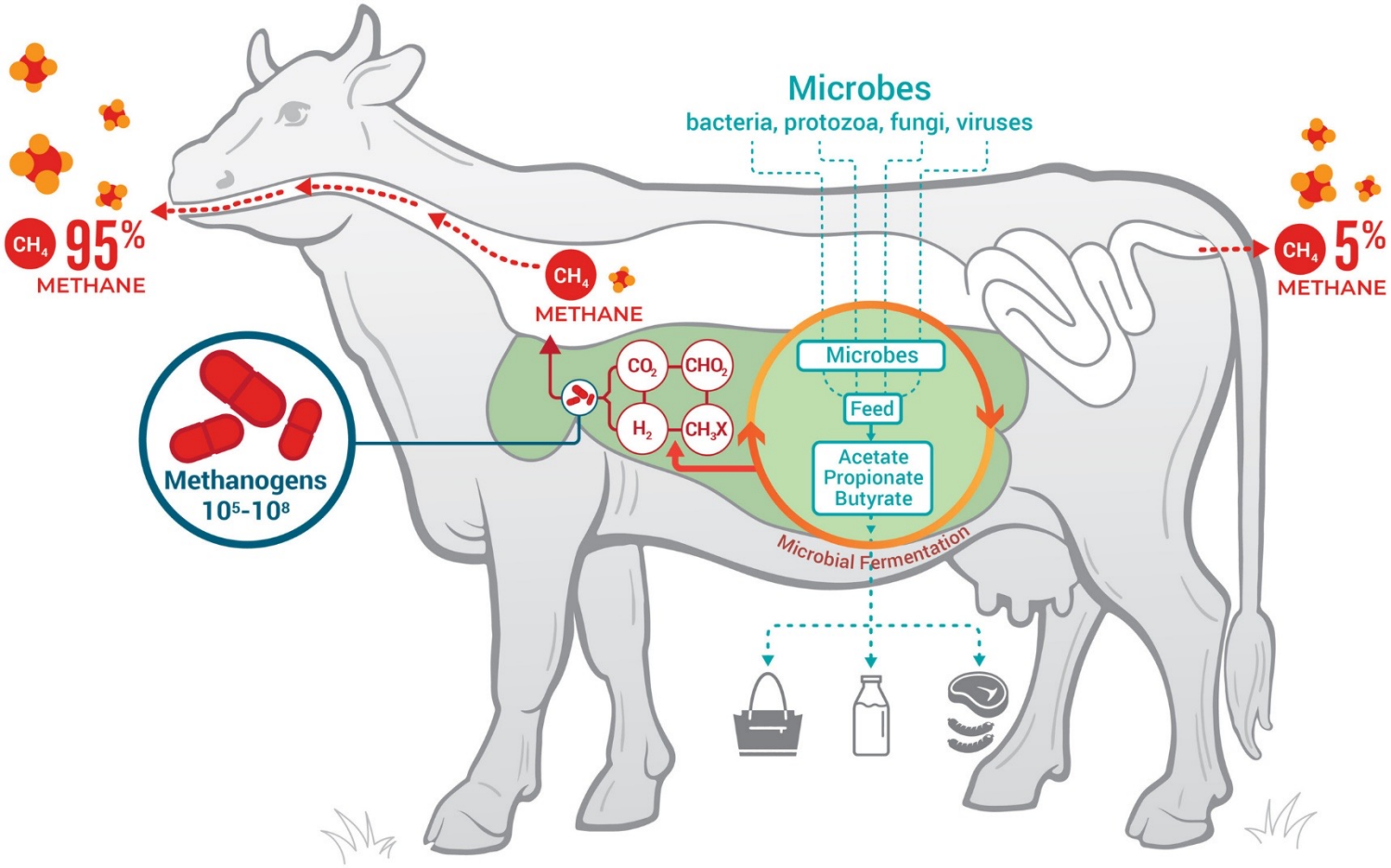
1.5 BILLION COWS
150 MILLION TONNES
CH4

12.9 Gt CO2-e*

***Larger than the annual GHG emissions of:**

- China (#1) or
- US (#2), EU-27 (#3) and India (#4) combined

METHAN



Methanogens have a complex metabolism that allows them to create methane as they produce the energy they need to survive.

Methanogenesis is the **terminal** step in the rumen digestive process, where complex molecules are degraded into their most basic compounds and then are converted to methane by methanogens.

The CH_4 produced is not used by the animal itself, but instead represents an energy loss (2–12% of gross energy) to the atmosphere.

A DISRUPTIVE TECHNOLOGY

ASPARAGOPSIS- RED SEAWEED

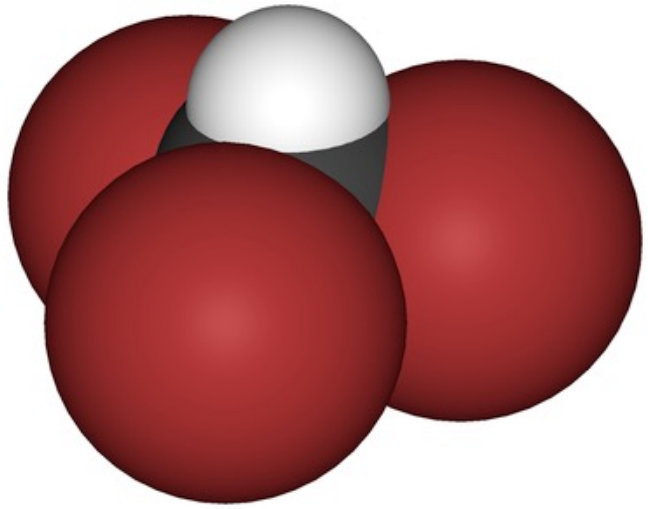
Asparagopsis armata (cold water species)

Asparagopsis taxiformis (warm water species)

FAST FACTS

- Native in Australia and New Zealand
- Natural material – no 'chemicals' used
- Unequivocal efficacy @ 0.5% of diet
  - 90+% methane reduction
  - improves feed efficiency
- Safety validated at commercial doses

HOW DOES ASPARAGOPSIS WORK?
ENTER BROMOFORM

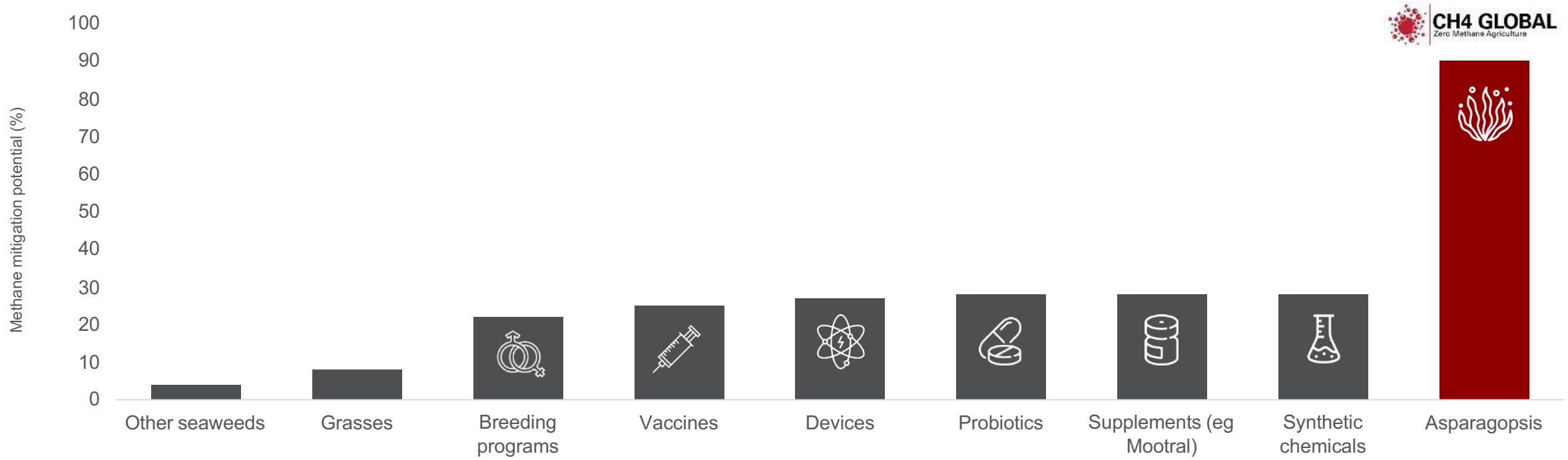


The mechanism of action of bromoform in methane reduction is reacting with reduced vitamin B12 and inhibition of the B12 dependent methyl- transferase step of methanogenesis.

Bromoform redirects energy lost as CH4 into beneficial metabolism resulting in improved feed utilisation and improved animal productivity… 12% in the rumen and another 10% in the small intestine.

HOW ASPARAGOPSIS COMPARES

~90% METHANE REDUCTION, SCALABILITY, COST-EFFECTIVE & NATURAL



	Other seaweeds	Grasses	Breeding programs	Vaccines	Devices	Probiotics	Supplements (eg Mootral)	Synthetic chemicals	Asparagopsis
Natural Product	✓	✓	✓	✗	✓	✓	✓	✗	✓
Scalable	✓	✓	✗	✗	✗	✓	✓	✓	✓
Inexpensive	✓	✓	✗	✗	✗	✓	✓	✗	✓
Beneficial - Health	✓	✓	✗	✗	✗	✓	✓	✗	✓

OCEAN AND LAND CROPPING
JUST LIKE LAND PLANTS

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IN THIS TOGETHER

SOUTH AUSTRALIA, THE SEAWEED SCIENCE STATE

Government of South Australia
Primary Industries and Regions SA

SARDI
SOUTH AUSTRALIAN RESEARCH AND DEVELOPMENT INSTITUTE

University of South Australia

THE UNIVERSITY of ADELAIDE

DAVIES LIVESTOCK RESEARCH CENTRE

PIRSA

MB-CRC
Marine Bioproducts Cooperative Research Centre

STRATEGIC PARTNERS
IN THIS TOGETHER

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KASANDI

NNAC

HB RURAL FEEDLOT

CirPro

CLEANSEAS

LAND-BASED PRODUCTION
CLEAN SEAS SEAFOOD

CH4 GLOBAL
Zero Methane Agriculture

HATCHERY AND MARINE OPS
KASANDI

FIRST NATION AND FIRST TO MARKET
NARUNGGA NATION ABORIGINAL CORPORATION

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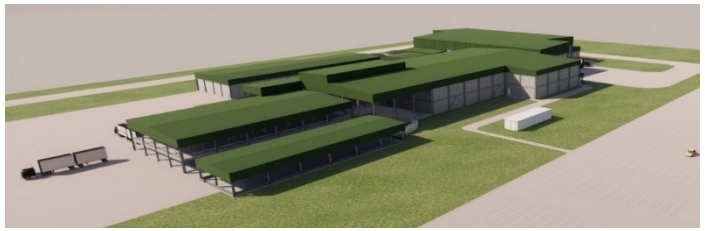
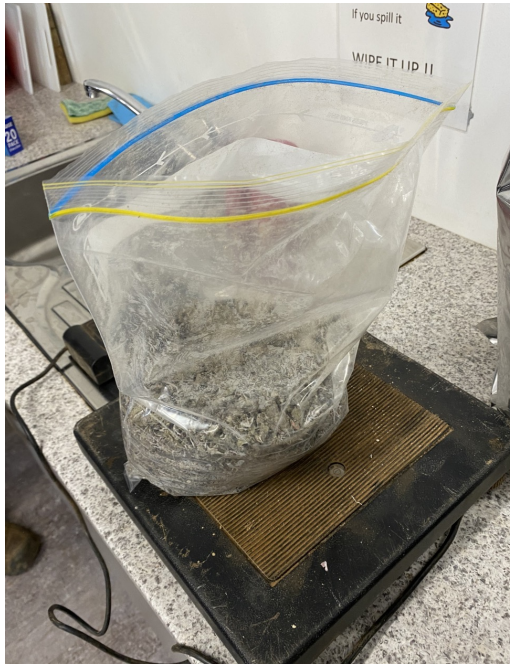
Zero Methane Agriculture

FEEDLOT COMMERCIAL USE- GLOBAL FIRST
CIRPRO AND HB RURAL



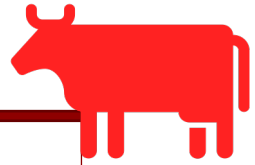


RIPPLE EFFECT

WHEN IT ALL COMES TOGETHER
SEAWEED ECOSYSTEM (SA)

CH4 GLOBAL
Zero Methane Agriculture

- Measurable nitrogen sequestration
- Capacity building and sustainable business model for First Nation participation
- Regional/Rural capacity building- jobs, training hubs and farm diversification
- A new feedlot strategy
- Value add to hot carcass- collagen and calcium



- New aquaculture hubs of activity- Re-use and repurpose assets
- Positive marine ecosystem effect
- Increased biomass limit for finfish- 4t to 20t within same footprint
- More fish protein
- Centralised processing online with alternative energy suppliers
- Local skill development in formulation and feed manufacturing
- Lower FCR or quicker to market
- Improved health, biomass gain and heat management
- More meat protein
- Affordable Low methane meat- *Kere to Country*

Disruptive Agtech evolution

IMPACT

Atmosphere

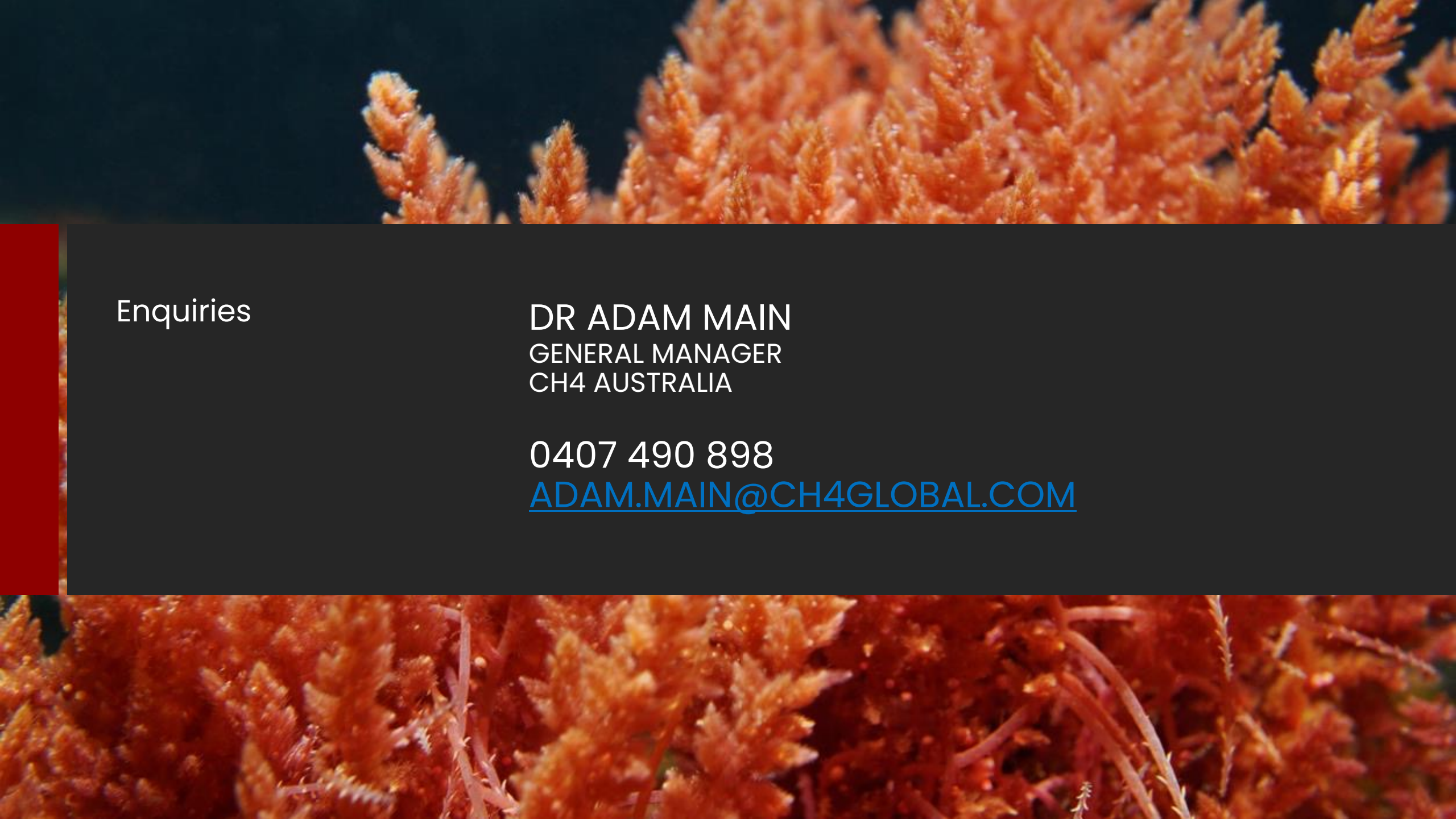
- Reduced GHG
- Methane pledge now achievable
- Slow Climate Crisis

- Reduced methane output
- Increased feed efficiency
- Positive value for farmers
- First Nations impact
- More protein into food chain

Land

Oceans

- Revenue for aquaculture farmers
- More protein into food chain
- Increased fish aquaculture
- Reduced ocean acidification
- Reduced eutrophication
- Revitalized aquatic habitats



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