



Effects on methane emissions and growth performance in beef cattle supplemented with oil macerate of *Asparagopsis taxiformis*.

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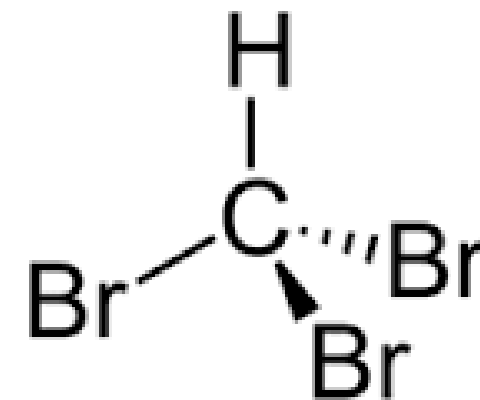
Asparagopsis taxiformis
(Delile)
Trevisan de Saint-Léon, 1845

Red macroalgae that contains high levels of bioactive substances capable of reducing CH₄ production in the rumen.



Fonte: Pepe Brix, National Geographic Portugal, CCMAR, UAlg

Bromoform CHBr_3

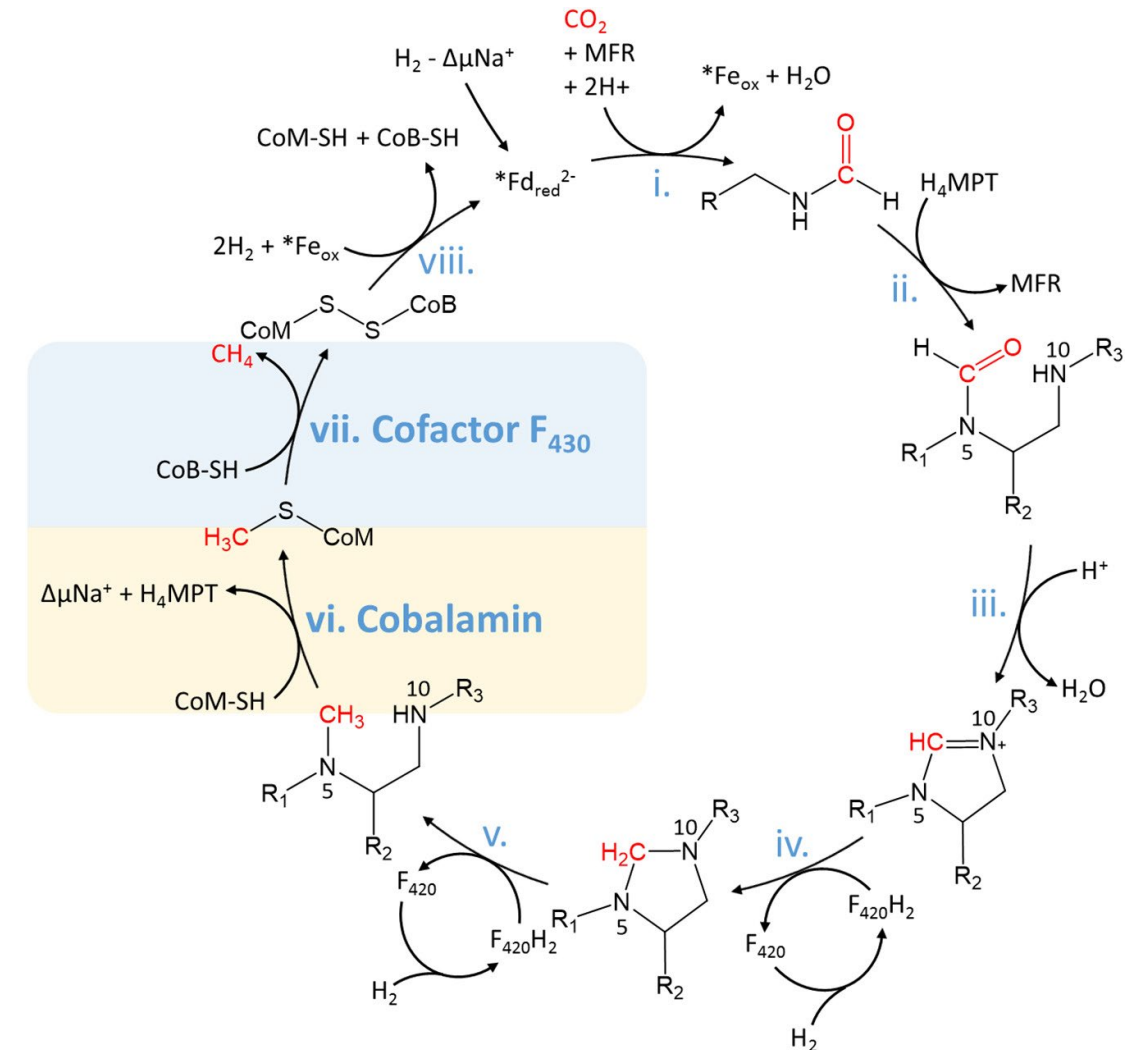


Methanogenesis

BROMOFORM

Halogenated compound presente in this algae that has an inhibitory action on *archaea methanogenic* – blocking the production of CH_4

Necessary a processing method – easy, economical and provides the stability of Bromoform - **Highly volatile.**

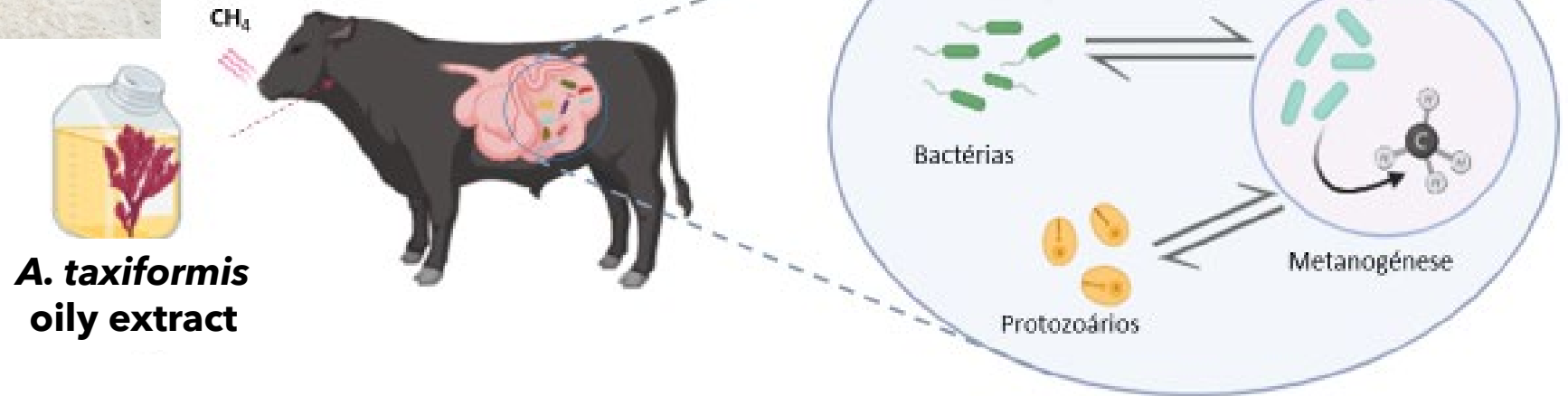


Source: Glasson CR et al. Benefits and risks of including the bromoform containing seaweed asparagopsis in feed for the reduction of methane production from ruminants. 2022

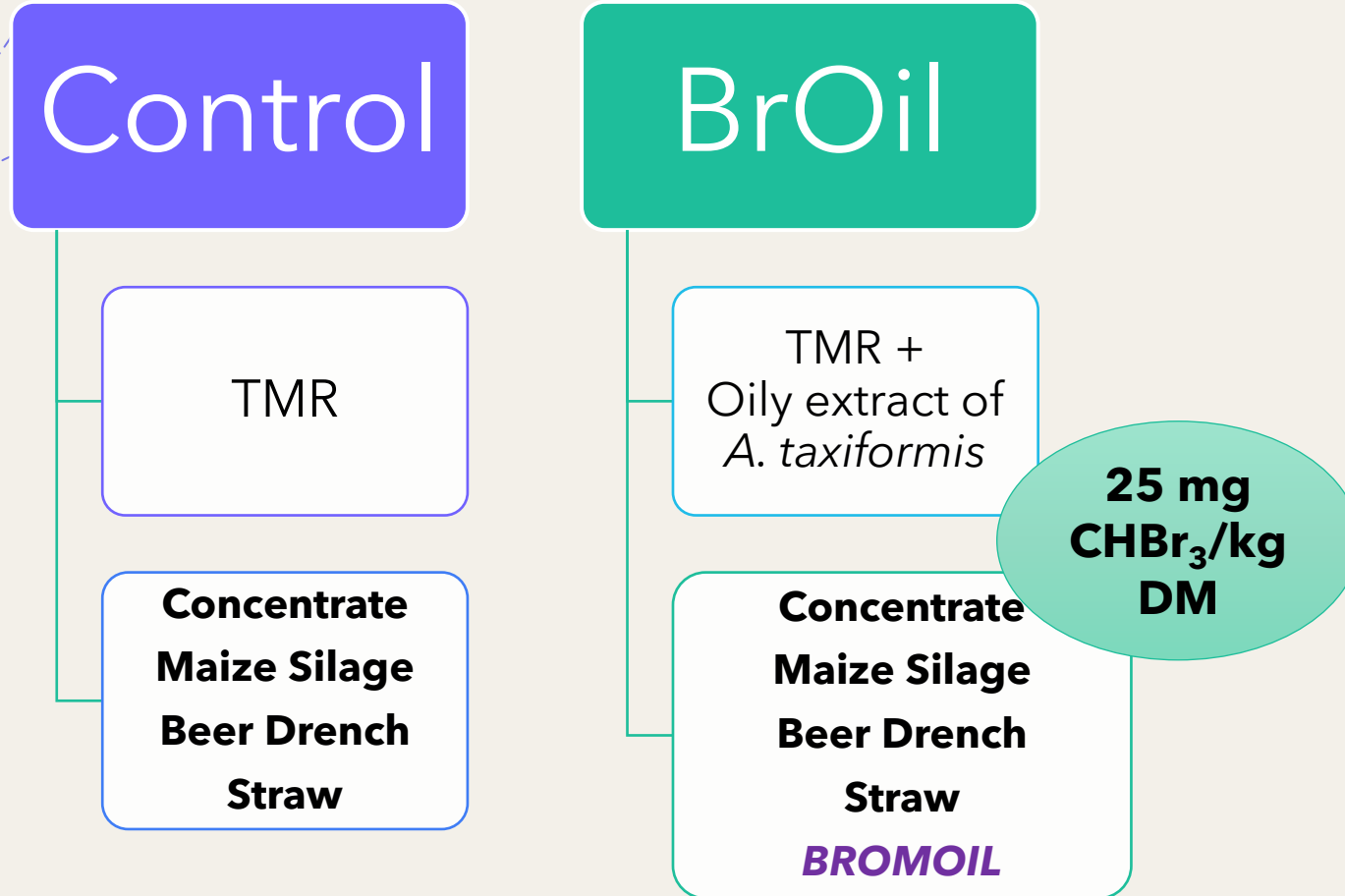
Immersing algae biomass in vegetable oil: Macerate of *Asparagopsis taxiformis* = Bromoil as a supplement



We tested the inclusion of Bromoil in beef cattle diets providing **25 mg $\text{CHBr}_3/\text{kg DM}$** .



2 treatments: Diets



TMR: Total mixed ration



Material and Methods

- 20 Crossbred Angus males
- 4 Pens - 5 animals/pen
- Diets *ad libitum*
- t = 2 months
- Weight Gain (weekly)
- Feed Intake (daily)
- Individual CH₄ and CO₂ emissions measured using GreenFeed® unit (who stayed with each group for 1 week and then changed).





Results Growth performance

	Diet		SEM	P-value
	Control	BrOil		
CHBr₃ Intake (mg/day)	0	215.9	-	-
Feed Intake (kg/day)	23.3	20.2	0.33	<0.001*
DM Intake (kg/day)	10.3	8.6	0.14	0.015*
ADG (kg)	1.34	1.23	0.106	0.523
Feed CR	18.37	17.45	1.747	0.715
DM CR	8.12	7.45	0.751	0.539

ADG - Average daily weight gain
CR - Conversion ratio

Results Carcass traits

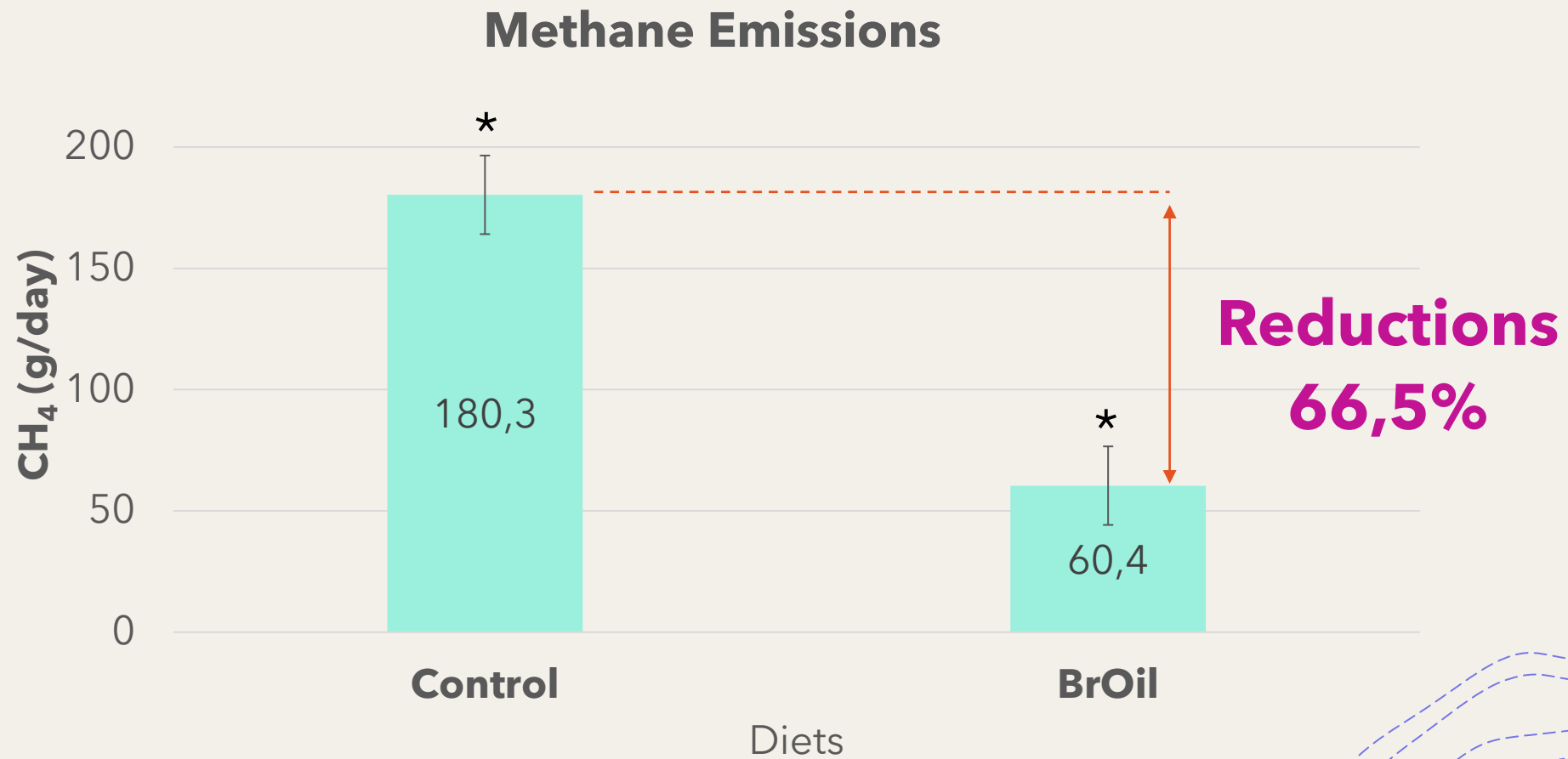
	Diet			
	Control	BrOil	SEM	<i>P-value</i>
LSW (kg)	589	569	13.1	0.292
HCW (kg)	331	324	7.3	0.477
DP (%)	56.2	56.9	0.60	0.438

LSW - Live slaughter weight

HCW - Hot carcass weight

DP - Dressing percentage

Results CH₄ Production



Results Life Cycle Analysis



kg CO ₂ eq/Animal	Diets		SEM	<i>P</i> - value
	Control	BrOil		
Rumen fermentation	271	91	24.4	0.04*
Feeds	146	134	2.1	0.06
Manure	33	28	0.8	0.06
Finishing period Carbon Footprint	448	253	27.9	0.04*

Results

Presence of CHBr_3 in meat and liver

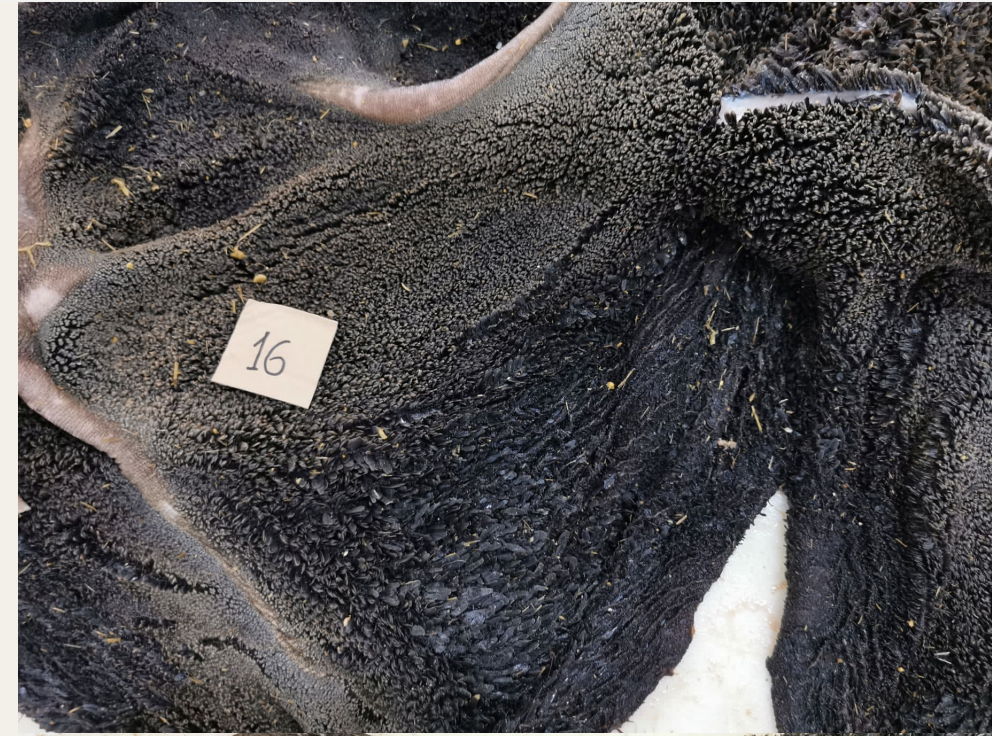
- Analysed by GC-MS
- Not detected (zero)
- The animals were consumed.



Results

Rumen health

- No significant lesions were found in the rumens of BrOil animals when compared to Control animals.



We also have results about

- + **Emissions:** in kg of DM Intake, Weight gain, ...
- + **Meat quality:** Tasting panel, Nutritional analysis, Fatty acids, Color,...
- + **Health:** Pathology and histology of the rumens.
- + % of fat, lean and bone in the carcass.

Short conclusions

CH₄ emissions were reduced by more than **66%** with just **0.0025%** of CHBr₃.

No traces of CHBr₃ were detected in the meat of the animals after slaughter.

Feed and DM intake was lower in the BrOil animals. There were no differences in any other growth indices.

Carbon Footprint of the BrOil diet was reduced by **44%** during the Finishing Period.

Further research is needed to ensure that Bromoil can be administered without adversely affecting animal health and productivity.

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Thank you for your attention !