

24 March 2021

Attn: Submissions analysis team, Climate Change Commission

**Submission: Climate Action for Aotearoa**

**Introduction.**

Zest Biotech presents 7 key points which Zest Biotech believes the Climate Change Commission must consider and respond to if Aotearoa's response to climate change, particularly biogenic emissions, is to move forward:

1. Consider modifying the Commission's approach and guidance to reflect the international scientific consensus and FAO guidance.
2. Safeguard, embrace and promote our valuable pasture-fed brand.
3. Draw from knowledge gained by organic farmers: practices which produce lower emissions and increase carbon sequestration. This knowledge can be applied seamlessly in conventional farming systems.
4. Objectively reconsider the Biozest technology: a technology developed and manufactured in Aotearoa that can be used on organic, regenerative, and conventional farms, is safe to apply, has no residue issues, is approved by all relevant regulatory bodies and, by focusing on ruminant efficiency, increases productivity while reducing methane and nitrous oxide emissions. Biozest is available and in use on farms in Aotearoa right now and farmers are already realising the benefits in terms of increased productivity.
5. Explore options to remove barriers which are blocking, or undermining technologies developed outside of our CRIs and PGgRc consortium members. Ensure all technologies brought to the attention of the commission are mentioned in the report and are accurately described and that the benefits/shortcomings are fully disclosed.
6. Develop pathways to ensure our farmers, our economy, and our environment benefit from homegrown technologies. Ensure that no commissioners have a conflict of interest that may prevent them from objectively considering all available technologies. Ensure that the Commission has/assembles the depth of knowledge to undertake peer review of all available mitigation options/technologies.
7. Consider Public Private Partnerships, often employed when a problem is large, urgent or difficult to overcome, to progress the development of mitigation technologies.

The balance of this report elaborates on each of these themes.

Zest Biotech is a biotechnology company based in Pukekohe. Zest Biotech has developed and proven a technology trademarked Biozest.

This document will be released to the public.

**1. Consider modifying the approach and guidance to reflect the international scientific consensus. The FAO has brought together international scientists to develop methods and tools to reduce GHG liabilities. Mitigation should focus on reducing methane density and this can be measured using the (free) modelling tool, GLEAM, developed by the FAO.**

The UN FAO states that “Relative to other global greenhouse gas abatement opportunities, reducing enteric methane through productivity gains is the lowest cost option and has a direct economic benefit to farmers”.

This approach was identified at a US EPA sponsored workshop. This workshop was conducted under the auspices of the IPCC in 1989 ([Improving Ruminant Production and Reducing Methane Emissions from Ruminants Through Strategic Supplementation](#)) and, although this workshop took place over 30 years ago, reducing methane emissions through increasing productivity remains the best available option.

The FAO has compiled a [range of options](#), many of which can be implemented on Aotearoa’s farms. This strategy also ensures that other global challenges, in particular poverty alleviation and food security, are also addressed. Therefore, farming must become more efficient resulting in an increase in revenue and decrease in carbon emission intensity per unit of product (and a gross reduction in emissions).

We can immediately follow the [IPCC/UN FAO guidelines](#). This is an economically smart, climate smart strategy to adopt. **There is current international scientific consensus on the best approach to reducing emissions from agriculture** and Zest Biotech continues to follow this approach.

Our CRIs have decided to deviate from this consensus (perhaps due to the development of IP centred around the biota of the rumen?). Unfortunately, their approach has not yielded tools for our farmers. They have not lacked funding. Perhaps this approach should be reviewed?

**The FAO has emphasised that we should focus on methane density rather than trying to measure methane per se.** Because the targets for methane reductions are based on comparisons to 2017 levels this is an advantage for NZ farmers. US and EU farmers had lower methane density per unit of milk/meat than Aotearoa’s farms at this point. **This gives us an advantage** as there is more room for improvement on 2017 levels on farms in Aotearoa compared to US farms and we do have the technology to make these improvements.

Toggling between methane density and methane per se in the Commission’s report is confusing. Current measurement techniques (largely lab or chamber based) have serious limitations, Therefore, biogenic methane per se cannot be accurately measured. If we can’t measure it, it is difficult to manage it.

The FAO has set up the [GLEAM](#) model to overcome this. A particular advantage of GLEAM is that the model takes into account the science of how ruminants produce urea and methane and the physiological and biochemical relationship between urea and methane. Because of this relationship,

**urea related nitrous oxide and methane cannot be considered separately.** This relationship is discussed in more detail in Section 4 below.

GLEAM has been developed to measure and account for all farm emissions for each sector, farming type and geographical area. Country-specific emissions factors are also defined in the National Inventory Reports (this includes data for Aotearoa). Baselines have been established and the tool is constantly being improved and updated. Therefore, any changes in farming operations that contribute to the reduction of methane, nitrous oxide and carbon dioxide can be quantified and effectively managed.

**GLEAM is freely available and includes an online tool: <https://gleami.apps.fao.org/>.**

We laid out our concerns regarding the use and funding of Overseer in our submission on the Climate Change Bill (2019):

*The current and ongoing ownership and management of Overseer is not clear but here appears to be a serious conflict of interest (Companies Office information shows that Overseer is owned by Overseer Limited, with that company owned up to 99.93% by New Zealand Phosphate Company Limited, with that company in turn owned 50/50 by Ballance and Ravensdown) this also presents a concerning opportunity for data mining. This private ownership and consequent conflict of interest will likely limit the system's recognition of tools and methodologies developed by outside sources (this has been an issue to date). This will drive up the costs and limit the feasibility of bringing new technologies to market. This, in turn, will delay and/or inhibit the farming sector's ability to adopt climate smart solutions and could threaten the ability of the sector to achieve the Climate Bill targets.*

We note that, since our submission in 2019, ownership has now been split 50:50 between AgResearch Limited and NZ Phosphate Company Limited (Balance and Ravensdown). This does little to alleviate concerns regarding conflict of interest and limitations on recognition of available technologies. The impact of Ravensdown and Balance's involvement as Aotearoa's dominating fertiliser companies is clear. The impact of 50% ownership by AgResearch is discussed further in Section 5 below.

References:

[Improving Ruminant Production and Reducing Methane Emissions from Ruminants Through Strategic Supplementation](#)

<http://www.fao.org/3/CA2929EN/ca2929en.pdf>

<https://www.sciencedirect.com/science/article/pii/S0022030218303709>

<http://www.fao.org/gleam/en/>

<https://gleami.apps.fao.org/>

**2. Safeguard, embrace and promote our valuable pasture-fed brand. This is a market advantage that we should not disregard. Failing to take adequate action to reduce GHG or moving to GE grasses is a risky strategy. We should continue to differentiate our products and aim for the top of the market.**

There is increasing consumer preference for both grass fed meat (particularly beef) and grass fed milk products. [Research](#) has shown that grass fed beef has low fat, increased antioxidants and a more desirable saturated fatty acid profile.

“Pasture feeding has been demonstrated to have a positive impact on the nutrient profile of milk, increasing the content of some beneficial nutrients such as Omega-3 polyunsaturated fatty acids, vaccenic acid, and conjugated linoleic acid (CLA), while reducing the levels of Omega-6 fatty acids and palmitic acid. These resultant alterations to the nutritional profile of “Grass-Fed” milk resonate with consumers that desire healthy, “natural”, and sustainable dairy products.” [The “Grass-Fed” Milk Story: Understanding the Impact of Pasture Feeding on the Composition and Quality of Bovine Milk](#) (review paper).

Companies in Aotearoa recognise the value of this brand and are marketing products on this point of differentiation: dairy company Synlait is attempting to take a premium product to the US market on a ‘grass fed’ brand.

Our pasture fed brand is valuable in international markets and enables us to position Aotearoa’s meat and milk as premium products which command premium prices.

This market benefit – our grass/pasture-fed milk and meat brand - is already under pressure. The US Department of Agriculture has introduced a very restrictive definition of Grass-Fed milk or meat. Essentially, to meet the definition, livestock must be feed only grass or crops in vegetative (pre-grain) stage.

NZ beef and milk products can potentially meet the requirements to be labelled as ‘Grass-Fed’ in the US market. Particularly as our farmers move away from PKE and towards technology such as Biozest (to increase pasture productivity and increase the functional value of pasture) farmers will have less need to supplement feed and can more easily meet the USDA definition of ‘Grass Fed’.

The full grass-fed standard can be viewed [here](#).

International standards are tightening, and we should be prepared to respond in terms of farming practices. It is important that we are aware of such changes in our export markets and continue to position our products at the premium end of the market.

Another risk to our brand is Aotearoa’s lack of GHG reduction progress to date. Our international contemporaries within the scientific community are aware of the Aotearoa’s [big talk with little action](#).

Our industry competitors are also highly aware of Aotearoa's lack of action. The Irish Farmers Association has called for NZ sheepmeat exports to be [subject to the same environmental standards as EU sheepmeat](#). They argue that EU strategies such as the EU Green Deal, Farm to Fork and Biodiversity strategies increase standards and that Aotearoa's trade quota to the EU should not be increased while farmers in Aotearoa are not meeting the same environmental standards.

Meanwhile, Irish producers recognise the value of their grass fed produce: Bord Bia (the Irish food board) has implemented a new Grass Fed Standard for dairy processors and a scheme for beef will follow.

*"For dairy processors to be eligible to market to this new standard, the milk they process must achieve a grass fed average of 95% (the minimum requirement for an individual herd to qualify as grass-fed is a diet of 90% grass, with 99% of Irish dairy farms expected to meet that threshold)"*  
[Ireland: Opportunities for New Zealand Agri-Business - 21 October 2020, MFAT.](#)

It is worth mentioning here a key statement from the same report regarding the adoption of tech solutions on Irish farms:

*"Irish farmers are practical when it comes to selecting their choice of agritech products and solutions - "if it works, it works" is the mantra. Given the higher growth and income levels in the dairy sector, dairy farmers have a greater capacity to invest in and adopt new technologies earlier."*

So, we should know the value of our pasture fed milk and meat brand (if we don't our competitors certainly do). We know the risk to our exports if we continue to delay action to reduce GHG emissions. Yet one of the Commission's featured technologies is Genetically Engineered grass.

GM ryegrass. The report recognises that the introduction of any GE product will face major regulatory hurdles. Also, in light of international consumer demand for cleaner, environmentally sound, increasingly organic food, even if GE derived produce is on the market will people want it? Can we still demand a premium price?

Once our farmers have gone through the expense of resowing pasture in GE grasses and the grass becomes widespread we can't turn back the clock. We can't reclaim these markets. To shift NZ en masse to GM production across dairy and/or beef industries is a risky strategy.

The GE grass is still in the early stages of development and is untested in the field.

Moving to Genetically Engineered grasses is flying in the face of evidence again. It seems that Aotearoa is driven down a seemingly flawed path based on the technology or IP we think we can develop or make money from rather than scientific evidence and market trends.

Our pasture fed brand is valuable. We have an advantage and we should be focusing on how we can support farmers to safeguard, embrace and promote this valuable brand.

References:

<https://pubmed.ncbi.nlm.nih.gov/20219103/>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6723057/>

<https://www.fsis.usda.gov/wps/wcm/connect/6fe3cd56-6809-4239-b7a2-bccb82a30588/RaisingClaims.pdf?MOD=AJPERES>

<https://www.fsis.usda.gov/wps/wcm/connect/6fe3cd56-6809-4239-b7a2-bccb82a30588/RaisingClaims.pdf?MOD=AJPERES>.

<https://www.newsroom.co.nz/overseas-doubts-grow-about-nzs-climate-commitment>

<https://www.agriland.ie/farming-news/madness-to-make-any-offer-to-new-zealand-on-lamb-imports/>

<https://www.mfat.govt.nz/assets/Trade-General/Trade-Market-reports/Ireland-Opportunities-for-New-Zealand-Agri-Business-21-October-2020-PDF.pdf>

3. Draw from knowledge gained by organic farmers. This may or may not involve conversion but there is a clear advantage, in terms of GHG reduction, in adopting techniques developed by organic farmers that have now been more widely researched and verified. Organic agriculture practices produce lower emissions and increase carbon sequestration. Our competitors recognise this and are increasing organic production.

*"FAO promotes organic agriculture as an alternative approach that maximizes the performance of renewable resources and optimizes nutrient and energy flows in agroecosystems. **Life cycle assessments show that emissions in conventional production systems are always higher than those of organic systems, based on production area.** Soil emissions of nitrous oxides and methane from arable or pasture use of dried peat lands can be avoided by organic management practices. Many field trials worldwide show that organic fertilization compared to mineral fertilization is increasing soil organic carbon and thus, sequestering large amounts of CO<sub>2</sub> from the atmosphere to the soil. **Lower greenhouse gas emissions for crop production and enhanced carbon sequestration, coupled with additional benefits of biodiversity and other environmental services, makes organic agriculture a farming method with many advantages and considerable potential for mitigating and adopting to climate change.**" [Organic Agriculture and Climate Change, FAO.](#)*

This is supported by published literature:

*An important potential contribution of organically managed systems to climate change mitigation is identified in the careful management of nutrients and, hence, the reduction of N<sub>2</sub>O emissions from soils. Another high mitigation potential of organic agriculture lies in carbon sequestration in soils. In a first estimate, the emission reduction potential by abstention from mineral fertilizers is calculated to be about 20% and the compensation potential by carbon sequestration to be about 40–72% of the world's current annual agricultural greenhouse gas (GHG) emissions, but further research is needed to consolidate these numbers. On the adaptation side, organic agriculture systems have a strong potential for building resilient food systems in the face of uncertainties, through farm diversification and building soil fertility with organic matter. Additionally, organic agriculture offers alternatives to energy-intensive production inputs such as synthetic fertilizers. [Organic agriculture and climate change, Scialabba and Müller-Lindenlauf.](#)*

The EU Commission has developed the "[Farm to Fork Strategy](#)". New targets for the EU as a whole aim to make food systems healthier and more environmentally friendly and include halving the use of pesticides, reducing fertiliser use by 20%, **increasing agricultural land under organic farming to 25%**, and lowering antimicrobials used for farmed animals by 50%.

China already has the 3rd largest organic agricultural land area and [demand among Chinese consumers is growing](#). The Chinese Government is actively driving the increase in organic production via initiatives such as covering the cost of organic certification, funding on-farm infrastructure and organic fertilizers, training and marketing assistance.

Our competitors and consumers in export markets recognise the value of organics in terms of health and the environment. Organic farming practices should be considered alongside other strategies to reduce GHG emissions explored by the Commission. Aotearoa should not ignore this opportunity.

References:

<http://www.fao.org/organicag/oa-specialfeatures/oa-climatechange/en/>

[http://www.fao.org/fileadmin/templates/organicag/pdf/11\\_12\\_5\\_OA\\_CC\\_Scialabba\\_Muller-Lindenlauf.pdf](http://www.fao.org/fileadmin/templates/organicag/pdf/11_12_5_OA_CC_Scialabba_Muller-Lindenlauf.pdf)

[https://ec.europa.eu/food/farm2fork\\_en](https://ec.europa.eu/food/farm2fork_en)

[https://www.researchgate.net/publication/320584524\\_Analysis\\_of\\_Organic\\_and\\_Green\\_Food\\_Production\\_and\\_Consumption\\_Trends\\_in\\_China](https://www.researchgate.net/publication/320584524_Analysis_of_Organic_and_Green_Food_Production_and_Consumption_Trends_in_China)



**4. Objectively consider the Biozest technology: a technology developed and manufactured in Aotearoa that can be used on organic, regenerative and conventional farms, is safe to apply, has no residue issues, is approved by all relevant regulatory bodies and, by focusing on ruminant efficiency, increases productivity while reducing methane and nitrous oxide emissions. Biozest is available and in use on farms in Aotearoa right now and farmers are already realising the benefits in terms of increased productivity.**

#### Introduction to Biozest

Biozest is a molecular pattern recognition receptor signalling compound and an economically smart climate-smart farming solution.

Biozest is a liquid pasture spray that can be applied by helicopter or drone (using as little as 20 litres of water per hectare), tractor or quad bike. Biozest is organic certified (BioGro 5943) and has been assessed by MPI (ACVM Group) as exempt from registration (registration is required for pesticides or growth hormones).

Cows grazed on Biozest treated pasture can be milked into general supply without issue and Biozest is in use on Aotearoa's farms right now.

Biozest treatment of pasture increases production of phenylpropanoids. Phenylpropanoids help pasture to overcome pest, disease and environmental stress and significantly increase pasture productivity.

There are 2 significant areas of ruminant inefficiency that will enable us to improve productivity and reduce emissions from pastoral farming: reducing the loss of pasture protein as urea and reducing energy lost as methane. Addressing these two inefficiencies can both increase productivity and reduce environmental liabilities.

When livestock consume Biozest treated pasture a slight increase in simple sugars enables the livestock to produce more propionate and less acetate, therefore less methane and heat.

The increased phenylpropanoids in pasture conjugate with some of the pasture protein to reduce deamination in the rumen and reduce the production of urea and methane.

Pasture carbohydrate is more efficiently digested. This conserves energy - heat and methane loss is reduced. Pasture protein is more efficiently converted to milk and meat, consequently urea and methane waste is reduced.

**When Biozest treated pasture is consumed by ruminants, milk volume, milk solids, stock condition and weight improve. Production improvements of 30% have been achieved while urea waste has been reduced by between 20% to 48%.**

The relationship between urea and methane production means that from a reduction in excreted urea we are able to infer a reduction in methane emissions. For scientific evidence for this relationship refer to [1. For Urea](#) [2. For Methane](#).

Because scientists do not yet have an accurate method of directly measuring methane we can use modelling such as [GLEAM](#) to account for farm emissions when using Biozest. GLEAM is able to assess the impact of any changes in farming operations (not only the reduction in enteric methane

emissions but other co-benefits such as reduced supplementary feed etc – see table below) that contribute to the reduction of methane, nitrous oxide and carbon dioxide.

### Established Science

Biozest is a new technology developed from established science. As developers of the technology it is not Zest Biotech's role to publish the science in peer reviewed journals. This has already been done by scientists working across many, related disciplines.

[This publication](#), for example, is a decade old:

*“phytofactors as natural feed additives that can modify the rumen fermentation processes, improve the protein metabolism and, at the same time, reduce ammonia production and emission, and curb methane production and emission to the atmosphere”*

The science is established science. Those who call for peer review of the science are either not familiar with phenylpropanoids, ruminant methanogenesis science, or the call is designed to distract from fair consideration of our technology. A search of journals, or even Google, will yield a wide range of peer reviewed publications supporting the scientific basis of the Biozest technology.

### Biozest Trials and Data

Every claim we make is backed by visual evidence, farmer testimonials, science and, most importantly, controlled trial data.

The science that enabled the invention of Biozest is now mature and we have comprehensive trial data and the science to substantiate all claims regarding improvements in productivity and reductions in emissions.

Trial work includes large scale (commercial scale or real-world condition), full life-cycle trials carried out on entire herds or farms (e.g. milk production trials, dry stock farm trials) as well as controlled, smaller scale, split block/paddock trials (e.g. pasture productivity trials).

Biozest has been proven in trials to:

- Increase pasture productivity (Kg dry matter/hectare) (by 89-127%),
- Increase pasture palatability (kg dry matter consumed) (by more than 10%),
- Improve pasture performance in stress conditions (frost, drought and waterlogging),
- Lift soluble sugar production to improve ruminant digestion (by 18%),
- Improve stock condition (stud bulls returned an additional \$1645 per bull at sale),
- Increase dairy cow productivity: increased milk volume and milk solids,
- Increase dairy goat productivity: an additional 31% of milk volume and 33% of milk solids over a full milking season,
- Reduce the environmental impact of dairy farming. Both dairy cows (24-36% reduction) and dairy goats (36% reduction) excreted lower levels of urea in urine to help cut nitrate leaching and greenhouse gas emissions. In addition, the urea excreted is expected to be in a less leachable form.

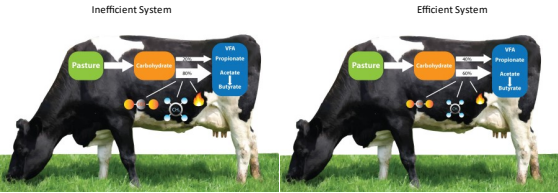
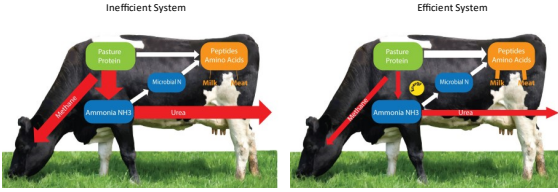
FAO Options for Reducing Greenhouse Gas Emissions

The FAO has developed and published a range of options to reduce emissions from agriculture.

It is common, as is the case for Biozest, that mitigation measures often simultaneously reduce environmental impacts and increase productivity, thereby contributing to food security and economic development.



Possible interventions to reduce emissions are thus, to a large extent, based on technologies and practices that improve production efficiency at animal and herd levels (see Pg14).

The following table illustrates how Biozest can be used as a tool to implement many of the recommended options to reduce emissions from agriculture.

<p><b>FAO Options for Reducing GHG Emissions</b>  <a href="http://www.fao.org/3/CA2929EN/ca2929en.pdf">http://www.fao.org/3/CA2929EN/ca2929en.pdf</a></p>	<p><b>Biozest Results.</b>  <a href="https://www.zestbiotech.co.nz/biozest-trials">https://www.zestbiotech.co.nz/biozest-trials</a></p>	<p><b>Biozest – all claims are backed by independent trial data, farm production, evidence and science</b></p>
<p>“GHG emissions represent inefficiencies in dairy systems. The loss of methane and nitrous oxide into the atmosphere means that energy and nitrogen inputs which could be directed towards production is lost.” (pg. 31)</p>	<p>We have improved the efficiencies of two aspects of the ruminant digestive system to convert more of pasture to milk and meat. Therefore, less is wasted as ammonia, urea (nitrous oxide) and methane. When livestock graze Biozest treated pasture milk and meat production can be increased by 30%. Urea excretion is reduced by up to 48%.</p> <p>This shows that we are no longer wasting our valuable inputs (energy and nitrogen) and efficiency is increased resulting in less waste (urea and GHG emissions) and more milk/meat.</p>	<p><b>Carbohydrate Digestive System</b></p>  <p><small>Copyright © Zest Biotech 2020</small></p> <p><b>Protein Digestive System</b></p>  <p><small>Copyright © Zest Biotech 2020</small></p>

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<b>1. Feed and feeding management</b>																																																														
<b>Increase feed efficiency</b> by optimizing the energy and protein content in feed.	<u>Biozest increases the functional quality of pasture.</u> Biozest treatment enables the pasture itself to synthesise more simple sugars and bioactive molecules (phenylpropanoids) that can <u>improve carbohydrate and protein digestion efficiencies.</u>	<p align="center"><b>Dairy Goats Full Life Cycle Trial Results</b></p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px;"> <p align="center"><u>Urea Excretion</u></p> </div> <div style="border: 1px solid black; padding: 5px;"> <p align="center"><u>Milk Solids Production</u></p> <p align="center"><small>Trial year compared with previous year</small></p> </div> </div> <p align="center"><u>Less waste more production</u></p>																																																												
<b>Use more locally produced feed</b> and source low-emissions feeds such as by-products. <b>Feed is the largest single cost</b> to dairy producers and its efficient use will improve net income and reduce potentially negative impacts on the environment (pg.31).	<p><u>Trials show pasture productivity may be doubled</u> resulting in more feed produced on farm and <u>less imported supplementary feed.</u></p> <p>Biozest treated pasture is more palatable, livestock eat the pasture right down and evenly, leaving minimum residuals to rot and emit CO<sub>2</sub> and methane.</p> <p>Biozest improves pasture production without the use of additional fertilisers. Baleage production has been doubled in trials. An analysis of the baleage from control and treated areas found that pasture production was</p>	<p align="center"><b>Increase In Baleage Productivity</b></p> <table border="1"> <thead> <tr> <th>1st Cut 21/10/2017</th> <th>Bales</th> <th>Bales/ha</th> <th>% increase in yield per hectare</th> </tr> </thead> <tbody> <tr> <td>Treated</td> <td>110</td> <td>11.2</td> <td>117%</td> </tr> <tr> <td>Untreated</td> <td>43</td> <td>4.3</td> <td>pre-08</td> </tr> </tbody> </table> <p align="center"><small>Spring 08/09 (5% urea/5% urea/5% urea/5% urea)</small></p> <table border="1"> <thead> <tr> <th>Post Grazed Paddocks</th> <th>Bales</th> <th>Bales/ha</th> <th>% increase in yield per hectare</th> </tr> </thead> <tbody> <tr> <td>Treated</td> <td>71</td> <td>20.4</td> <td>115%</td> </tr> <tr> <td>Untreated</td> <td>30</td> <td>8.6</td> <td>pre-08</td> </tr> </tbody> </table> <p align="center"><small>Spring 09/10 (5% urea/5% urea/5% urea)</small></p> <table border="1"> <thead> <tr> <th>Certified Organic Farm</th> <th>Bales</th> <th>Bales/ha (Average)</th> <th>% increase in yield per hectare</th> </tr> </thead> <tbody> <tr> <td>Treated</td> <td>13.31</td> <td>7%</td> <td>pre-08</td> </tr> <tr> <td>Untreated</td> <td>7.47</td> <td></td> <td></td> </tr> </tbody> </table> <p align="center"><small>Copyright © Zest Biotech 2020</small></p> <p align="center"><u>Livestock preferentially graze Biozest treated pasture.</u></p> <p align="center"><u>Less residual pasture in Biozest treated paddocks.</u></p> <table border="1"> <thead> <tr> <th>Date</th> <th>04/08/2010</th> <th>15/10/2010</th> <th>19/10/2010</th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>Paddock No.1</td> <td>After grazing</td> <td>Before grazing</td> <td>After grazing</td> <td>Increase in growth (between grazing)</td> <td>DM consumed</td> </tr> <tr> <td>Control</td> <td>1164</td> <td>1816</td> <td>776</td> <td>652</td> <td>1040</td> </tr> <tr> <td>Treated</td> <td>995</td> <td>1797</td> <td>540</td> <td>802</td> <td>1257</td> </tr> </tbody> </table>	1st Cut 21/10/2017	Bales	Bales/ha	% increase in yield per hectare	Treated	110	11.2	117%	Untreated	43	4.3	pre-08	Post Grazed Paddocks	Bales	Bales/ha	% increase in yield per hectare	Treated	71	20.4	115%	Untreated	30	8.6	pre-08	Certified Organic Farm	Bales	Bales/ha (Average)	% increase in yield per hectare	Treated	13.31	7%	pre-08	Untreated	7.47			Date	04/08/2010	15/10/2010	19/10/2010			Paddock No.1	After grazing	Before grazing	After grazing	Increase in growth (between grazing)	DM consumed	Control	1164	1816	776	652	1040	Treated	995	1797	540	802	1257
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<p>environmental welfare.” <a href="#">Pacheco &amp; Waghorn, 2008</a></p>	<p>doubled will no negative impact on feed quality and dry matter production.</p>	
<p><b>Carbon Sequestration</b>          Permanent grasslands (3.3 billion hectares) are estimated to contain globally 343 billion tonnes of carbon, nearly 50% more than is stored in forests worldwide  <a href="http://www.fao.org/3/a-i8098e.pdf">http://www.fao.org/3/a-i8098e.pdf</a>, pg. 5)</p> <p>Store more carbon in the soil by means of better grassland management.</p>	<p><u>Biozest treatment can double pasture productivity and therefore, sequester double the carbon</u> (this affirms our grass fed milk &amp; meat brand). The nutritional value of milk and meat also increases in pasture fed systems.</p> <p><u>Biozest improves pasture cover, density and resilience.</u> Trials confirm Biozest treatment resulted in denser pasture cover and double the pasture baleage yield; cultivation of supplementary feed was not necessary.</p> <p>Biozest treatment improves grass tiller and clover production (thicker pasture) The larger clump of grass results in increased root mass plus the increased clover nodulation are together expected to increase pasture and <u>soil sequestration</u> of carbon.</p>	<p><u>Double productivity and climate resilience</u></p> <p><b>Drought and Frost Tolerance</b></p> <p><b>Performance Under Soil/water Stress</b></p> <p><u>Denser pasture in Biozest Treated Paddocks.</u></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>CONTROL</p> </div> <div style="text-align: center;"> <p>BIOZEST</p> </div> </div>

																						
<p><b>Animal health and husbandry</b></p> <p>Reducing the prevalence of diseases and parasites would generally reduce emissions intensity as healthier animals are more productive, and thus produce lower emissions per unit of output.</p> <p>2. Mastitis infections cause approximately 3 to 4 percent decrease in milk yield (pg. 32)</p>	<p>Both trial data and observations show body condition, health and livestock productivity increases.</p>	<p><b>Ewes and Lambs: (Weighed at Docking)</b></p> <table border="1"> <thead> <tr> <th colspan="2">Ewes Weight</th> <th colspan="2">Lambs weight</th> </tr> </thead> <tbody> <tr> <td>Biozest</td> <td>73.3Kg</td> <td>Biozest</td> <td>23.5Kg</td> </tr> <tr> <td>Control</td> <td>69.0Kg</td> <td>Control</td> <td>22.7Kg</td> </tr> <tr> <td><b>Difference</b></td> <td><b>4.3Kg</b></td> <td><b>Difference</b></td> <td><b>0.8Kg</b></td> </tr> <tr> <td><b>% Difference.</b></td> <td><b>6%</b></td> <td><b>% Difference</b></td> <td><b>3%</b></td> </tr> </tbody> </table>  <p><small>Copyright Zest Biotech 2021</small> <span style="float: right;">Zest Biotech</span></p>	Ewes Weight		Lambs weight		Biozest	73.3Kg	Biozest	23.5Kg	Control	69.0Kg	Control	22.7Kg	<b>Difference</b>	<b>4.3Kg</b>	<b>Difference</b>	<b>0.8Kg</b>	<b>% Difference.</b>	<b>6%</b>	<b>% Difference</b>	<b>3%</b>
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<p><b>Other Emissions Sources</b></p> <p>Land use changes (LUC) induced by the production of feed (excluding grassland and grazing) (pg15)</p> <p>3. Fodder and feed production including application of mineral fertilizer (pg. 15)</p>	<p>Biozest treatment increases pasture productivity eliminating importation or cultivation of supplementary feed. The importation of carbon liabilities is avoided. An additional loss of carbon due to cultivation is avoided. This affirms our grass-fed brand.</p>																					
<p><b>4. Organic Production Systems</b></p> <p><a href="http://www.fao.org/3/CA2607EN/ca2607en.pdf">http://www.fao.org/3/CA2607EN/ca2607en.pdf</a></p> <p><a href="http://www.fao.org/organicag/oa-specialfeatures/oa-climatechange/en/">http://www.fao.org/organicag/oa-specialfeatures/oa-climatechange/en/</a></p>																						



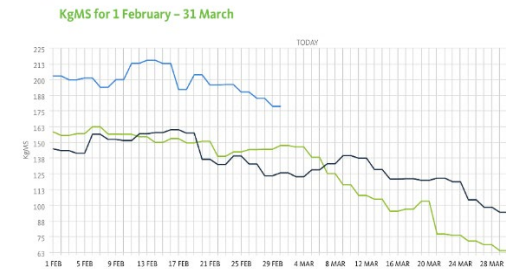
Increasing soil organic carbon can raise food production by 17.6 megatonnes per year and help maintain productivity in drier conditions.

“FAO promotes organic agriculture as an alternative approach that maximizes the performance of renewable resources and optimizes nutrient and energy flows in agroecosystems. Lower greenhouse gas emissions for crop production and enhanced carbon sequestration, coupled with additional benefits of biodiversity and other environmental services, makes organic agriculture a farming method with many advantages and considerable potential for mitigating and adapting to climate change.”

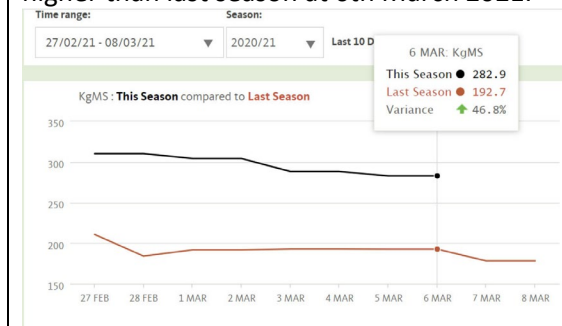
Biozest treatment of pasture in certified organic production system improves productivity significantly.

Productivity increases on organic farms using Biozest affirms the high level of productivity is achievable where nutrient energy flow is optimised and Biozest reduces abiotic stress (refer to graphs in section “ Carbon Sequestration” above).

A certified organic farm is using Biozest for the 1<sup>st</sup> time this season. The 1 March 2021 supply comparison shows a 42 % and 21% higher production of MS compared to last year and the previous year respectively



Another organic farm produced milk solids output 49% higher than last season at 6th March 2021.



## References

<https://www.nzgajournal.org.nz/index.php/ProNZGA/article/view/2738>

**5. Explore options to remove barriers which are blocking, or undermining technologies developed outside of our CRIs and PGgRc consortium members. Ensure all technologies brought to the attention of the commission are mentioned in the report and are accurately described and that the benefits/shortcomings are fully disclosed.**

#### Barriers to the success of new technologies

The biggest barrier to the success of new technologies is the current science funding model. Our CRI and University scientists are not free to go where results of hypotheses tell them to go. Instead, they are working towards KPIs and business milestones. As a result, Aotearoa has lost many good scientists.

The current science funding model makes it difficult for our scientists to undertake any work that does not contribute to the development of the CRI's own IP. It is also difficult for the CRIs/Universities to engage with outside companies/technologies if there is any crossover or perceived conflict with their own work. As our CRIs are developing other technology in this area, including the elusive vaccine and GE grasses, there appears to be a closed door to outside technologies which is holding back both their development and acceptance by the agriculture industry.

A 2018 review of the Greenhouse Gas Research Centre drew this issue to the Government's attention:

*"The use of the PGgRC as the primary conduit for stakeholder engagement is not satisfactory... Although most industry bodies are represented, there needs to be a more direct and active engagement with stakeholder groups and individuals by the Centre in its own right." (pg13)*

This was echoed (more explicitly) by a recent report, [Te Pae Kahurangi: Positioning Crown Research Institutes to collectively and respectively meet New Zealand's current and future needs](#), which identified that:

*"Stakeholders and, to varying degrees, CRIs themselves, identified several features of the existing operating model that are not working as well as they could including...aspects of public funding that sometimes **incentivise unproductive competition** and distort choices on ways to achieve impact from new knowledge."*

*The Panel recommends that:*

- *CRIs strengthen the mechanisms for, and **reduce the barriers to, collaboration** with each other and with **other science system participants**, including through adopting common practices wherever practicable*
- *MBIE reviews the ownership and funding arrangements (discussed below) to **strengthen incentives for purposeful collaboration** among CRIs and **with other science system participants**.*

The CRIs are now corporatized and it may not be in their commercial interests to engage with what they view as competing technologies. **Corporatization of CRIs and resulting corporate rules have led to turf protection and suppression of technologies developed outside of the CRIs.**



### The Commission's emphasis on early-stage technologies untested on-farm.

We note that a number of technologies are detailed and repeatedly mentioned in the Commission's report – most notably the search for a methane vaccine and methane inhibitors – particularly seaweed.

1. Methane inhibitors. The report recognises many of the issues in introducing methane inhibitors to our, largely, grass-fed farming systems. The report also mentions the use of seaweeds containing bromoform which the report concedes contain suspected carcinogens and ozone-depleting substances.

The Commission has omitted mentioning that the red seaweed emits bromoform as it grows. Developing this technology is like jumping out of the frying pan into the fire. Not only because of the direct environmental effect but also because of the following effect:

*"Brominated methane concentrations also have the potential to reduce hydroxyl radical (OH) concentrations, leaving OH unavailable to destroy greenhouse gases or gases involved in stratospheric ozone depletion".* [Production of bromoform and dibromomethane by Giant Kelp: Factors affecting release and comparison to anthropogenic bromine sources.](#)

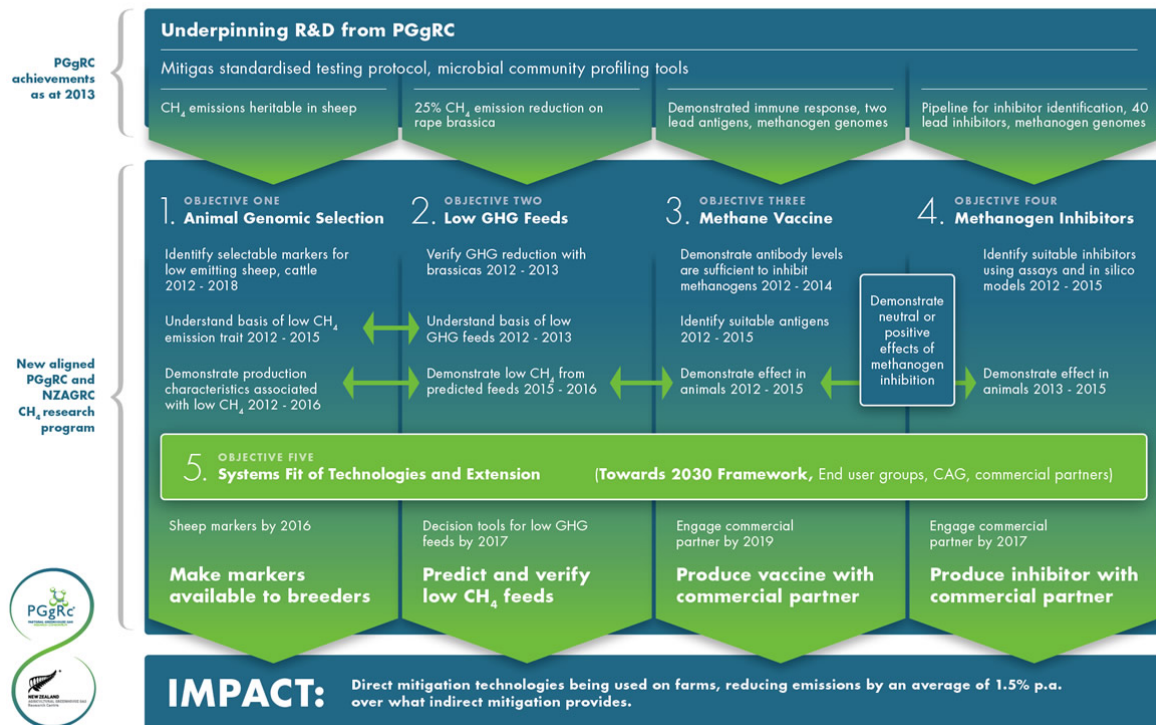
Bromoform, which includes methyl bromide, is banned overseas (but not in NZ). **The impact on animal health and residues must also be considered** and work on these areas must be carried out via full life cycle testing to codex standards.

The presence of brofoform means that researchers are effectively using seaweed as an antibiotic.

Even if the development is successful, additives such as this give our competitors, barn fed farmers who can feed these additives little and often, an advantage. Yet research continues to the tune of \$100,000 from the Government's Sustainable Food & Fibre Futures fund in 2019.

2. Methane vaccines. The Commission's report states that research to develop a methane vaccine is still in relatively early stages. This is contrary to the many press releases we have seen over the years: e.g. [2017 –'Vaccine to reduce methane from cows could be '5 to 7 years away'](#). We have been promised the vaccine within 5 years on many occasions over the last 10 years (see timeline below). These releases often appear either before a funding round or after positive press on alternative technologies.

**PGgRC MBIE Partnership Programme (2012-2019) to develop new commercialisation-ready direct GHG mitigation tools for pastoral farmers.**



According to the Commission’s report:

*“to date the process has not been proven to work in animals. “Without a working prototype, the methane reduction potential of this approach remains speculative. Researchers estimate that any vaccine is still a long way off and it is almost certain that a vaccine, if it can be developed, would not be available before 2030.”*

Yet, from a June 2020 news report: ‘After more than a decade’s work and over \$50m in funding... Last Budget, the Government delivered a boost: a doubling of the centre’s (NZAGGRC) annual funding. “In our first iteration we got just under \$50m for ten years, in our second iteration we’ve got \$50m for five years,” says Clark.’

This is an example of the behaviour highlighted in Te Pai Kahurangi and the 2018 review of the NZAGGRC (stifling of alternative technologies, turf protection) and has undoubtedly affected emerging technologies due not only to the diversion of funds towards this research black hole but because of the subtle and/or direct undermining of other technologies.

Anecdotally, the scientific consensus is that a vaccine is unlikely to succeed. A vaccine of this type is unlike trying to target a foreign organism such as Covid-19 in humans. The rumen is a free-flowing vessel and researchers are trying to alter innate, resident bacteria. Microorganisms typically develop resistance where this type of vaccine has been tried before. We have yet to see any evidence whatsoever to suggest success is imminent. This view is evidenced by the lack of concrete progress in the development of a vaccine. The research has had ample funding and time but there is evidence of repeated failure to meet published targets.

The Commission should refrain from promoting unproven technologies without having examined the validity of the idea, claims and the science. The Commission needs to take into account the fact that biological technologies usually take at least a decade to be fully commercialised. Full life cycle studies need to be completed and safety aspects to the environment, livestock and consumers need to be tested. The Commission must be aware that CRI's/Universities are cooperates and they operate as commercial entities. They cannot be given free ride to promote their unproven products and their advice accepted without careful, independent examination.

References:

<https://www.mpi.govt.nz/dmsdocument/32911/direct>

<https://www.mbie.govt.nz/assets/te-pae-kahurangi-report.pdf>

<https://aslopubs.onlinelibrary.wiley.com/doi/abs/10.4319/lo.1997.42.8.1725>

<https://www.nzherald.co.nz/the-country/news/vaccine-to-reduce-methane-from-cows-could-be-5-to-7-years-away/3H3LBQS4F4DC2QOZoya3YS3N3M/>

<https://www.stuff.co.nz/environment/climate-news/300039760/funding-boost-gives-methane-vaccine-a-better-shot>

**6. Develop pathways to ensure our farmers, our economy and our environment benefit from homegrown technologies. Ensure that no commissioners have a conflict of interest that may prevent them from objectively considering all available technologies. Ensure that the Commission has/assembles the depth of knowledge to undertake peer review of all available mitigation options/technologies.**

Zest Biotech has been in communication with the Commission since June 2020.

We shared our past submissions:

Vision Week:<https://www.visionweek.co.nz/forum/sustaining-nz/our-farmers-can-be-champions-of-the-economic-recovery-and-zero-carbon-economy?fbclid=IwAR1aJDq0MQX5XCqwlCkzsM3iHkroX-UepoWh9lx1NCSFnJWnO7XgYt46rVw>

Productivity Commission (Low emissions economy)

and

Climate Change Response (Zero Carbon) Amendment Bill

<https://www.zestbiotech.co.nz/submissions>

These submissions very clearly lay out the role that Biozest can play in reducing GHG from agriculture and include an introduction to the science behind the technology and trial data.

We also answered the [Call for Evidence](#) by the Interim Climate Change Commission and, in line with the Commission's advice, we did so by again pointing to our earlier submissions to the Productivity Commission (Low Emissions Economy) and on the Zero Carbon Bill.

We were in email communication with several members of the Commission from June 2020 through to 27 August 2020.

We raised early concerns via email that our technology was being ignored yet again:

I have to say that we are also puzzled at the fact that the Climate Change Commission seems intent on ignoring submissions made by Zest Biotech.

Your website states that "All the responses to the Call for Evidence will soon be available below, and these have been considered by our team as part of preparing our advice". But there is not the slightest indication that the Biozest technology was considered at all.

In response the Commission tried to reassure us that the report hadn't been written yet, implying that they had not dismissed Biozest.

We then received the following from the Commission:

I doubt the Commission is in a position to assess the science behind any particular product or endorse any particular research project ahead of those better placed to make those evaluations.

We replied with the following:

...we are not asking the Commission to assess the science or to endorse Biozest. We're only asking that the Commission understands that Biozest is a viable option and includes it alongside other options. We would hope that the Commission would be in a position to encourage those who do "make those evaluations" to objectively consider a research proposal that might finally yield

significant results in terms of a reduction in agricultural emissions. If the science must be assessed, and we understand why that may be required, we are open to (and have indeed requested) an independent peer review.

Our concern is that yet another report will be released that either ignores or marginalises Biozest, perpetuating the view that there are no financially viable options for reducing emissions from agriculture. This makes it increasingly difficult for us to gain any credibility that might move forward both sales (i.e actual environmental improvements on-farm) and research to quantify emissions reductions - crucial from both an economic perspective (in terms of retaining our "clean green" brand and market position – especially as grain-fed farmers have emissions reductions technology already) and crucial to meeting our international climate change obligations.

The Climate Commission’s own website (<https://www.climatecommission.govt.nz/what-we-do/what-we-do-overview/>) notes that -

“We research and analyse different factors that can affect our emissions. The outcome of this provides evidence-based advice to government on how to transition to a low-emission and climate-resilient economy.

“The advice we provide to the Government will be strongly rooted in the best available evidence, and analysis. We’re building our knowledge of the available technologies and approaches “...for example what technologies or mitigation actions could deliver the biggest difference.”

Zest Biotech has answered the call for evidence to ensure the Commission has knowledge of Biozest (an “available technology”) and believes that Biozest is one of the technologies that “could deliver the biggest difference”.

Zest Biotech has made similar submissions to the Parliamentary Commissioner for the Environment and to the Productivity Commission but when presented with a technology developed outside of the CRIs which has met all regulatory obligations, which is in use on-farm right now and which is supported by established science and trial data, they have all said they aren’t in a position to assess the technology – yet somehow they are in a position to produce reports describing "all" currently available or promising technologies. This makes absolutely no sense to us. What are the criteria for being included in these lists or advice provided to government?

Despite constant assurances from the institutes/research centres that other technologies will be ready any day, in reality, we have nothing. Progress has undeniably stalled. What is the financial and environmental cost of shutting the Biozest technology out?

How can we support the Commission to better understand the opportunity Biozest presents and ensure New Zealand benefits from this technology?

**The end result of this ongoing communication, provision of detailed information, data, previous submissions and a submission directly to the Commission: no mention whatsoever of Biozest.**

## Conflict of Interest

We note that Harry Clark, Director of NZAGRC is one of the Climate Change Commissioners.

The members of the NZAGRC are AgResearch, DairyNZ, Landcare Research, Lincoln University, Massey University, NIWA, PGgRc, Plant & Food Research and Scion. As outlined in Section 4 above, a number of these parties have been involved in 'unproductive competition' and have stifled emerging technologies.

We also note the heavy reliance or reference to BERG. This group is comprised of many of the same parties (including some of Aotearoa's largest and most influential companies) who are members of the PGgRc– which has already been found to be limiting collaboration.

The Commission must consider if those that are assessing technologies and determining what will or will not be included in this report are able to be objective. **There is a clear conflict of interest. The Commission has attempted to brush this off with this incredibly simple assessment of the conflict of interest:**

*While a number of board members continue to hold roles within these fields, our advice is independent and evidence-based.*

**The advice is not independent.**

The report is evidence that this conflict of interest has serious implications. If the Commission is unable to objectively review available/developing technologies it must commission an independent peer review.

We were informed before this report was published that the Commission would be looking at ALL mitigation options. We received the following via email:

*As a Commission, we are looking across mitigation opportunities **whether peer reviewed or not**, but obviously place stronger reliance on peer reviewed research.*

But we also received the following via email:

*The Climate Change Commission has an interest in understanding emerging technologies but is not in a position to evaluate a particular new technology itself.*

This email also indicated that there would be reliance on peer reviewed publications. This seems to indicate the Commission's scope did include a review of ALL available technologies but, without sufficient knowledge and skills, the Commission restricted the report to research that has been published in scientific journals.

As a result, this draft report only covers technologies in development (largely early stage and without any field testing whatsoever) but accompanied by articles published in journals. The peer reviewed articles are unable to provide any data of the effectiveness of, for example, the methane vaccine because it has not yet been developed. **Why the vaccine would rate any more than a passing mention while technologies in use on Aotearoa's farms is ignored completely is very difficult to understand.**

Technologies developed by companies working outside of the CRI/University sphere (which requires and funds publication of research) are dismissed – despite the weight of evidence in their favour.

This approach also ignores the fact that, despite peer review for publication, all technology should be reviewed by someone with the depth of understanding to recognise faults and shortcomings. The papers have been peer reviewed for the purposes of publication – **publication does not mean the technologies have been peer reviewed for their suitability as GHG mitigation tools on farms in Aotearoa.** It is clear that this has not occurred and that the commission perhaps lacks the personnel to undertake this type of independent peer review.

**A basic peer review would immediately reveal that, for example, the vaccine and GE grass are undeveloped, untested outside of the lab and currently unavailable as mitigation tools – they are unable to provide any evidence whatsoever of effectiveness on farm. This should drive further exploration to discover tools that are currently available.**

On hearing of the Commission's reliance on peer reviewed articles we provided the following response:

Publication in an academic journal is only one means of obtaining a peer review. Publication in such journals is not typical (or commercially desirable in terms of IP protection) for commercial technologies. Peer reviews are undertaken outside of academia, for example, for funding proposals, infrastructure projects, technology awards, patent applications, for a specific purpose and by those who have sufficient knowledge of the subject matter. That is the type of peer review that is suitable in this instance. We are prepared to make any required information available to anyone (who has relevant expertise but is not a competitor (in terms of either commercial interests or potential funding) who would like to conduct a peer review.

**The Commission did not take us up on this offer and was either unwilling or unable to recruit someone with the relevant expertise to undertake a review of the Biozest technology.**

There have been [several reports](#) published which have outlined what are described as available or promising mitigation technologies. All have focused primarily or entirely on technologies in development by our government funded institutions, particularly the vaccine. When questioned regarding the lack of mention of technologies developed outside these institutions the response is that the report was not intended to be a review of mitigation technologies.

**If the Commission also insists this is not a review of available tech and they do not have expertise to conduct such a review surely it is time a review of all available tech is carried out to help Aotearoa move forward?**

A group of independent scientists should be assembled i.e those with no connection to CRIs, Universities, and PGgRc members and are not dependent on funding from the government or consortium members: for example, retired scientists. Surely this is fundamental to moving forward? Promising available technology should be identified either for further research to confirm data or to upscale and maximise the benefits on-farm and for our environment.

**The Biozest technology and ALL potential solutions for agricultural GHG emissions must be independently and objectively assessed.**

References:

[https://www.productivity.govt.nz/assets/Documents/lowemissions/4e01d69a83/Productivity-Commission\\_Low-emissions-economy\\_Final-Report\\_FINAL\\_2.pdf](https://www.productivity.govt.nz/assets/Documents/lowemissions/4e01d69a83/Productivity-Commission_Low-emissions-economy_Final-Report_FINAL_2.pdf)

<https://www.pce.parliament.nz/media/1678/climate-change-and-agriculture-web.pdf>



**7. FAO recommends the establishment of Public Private Partnerships to progress the development of mitigation technologies. This type of partnership has been done before in Aotearoa and is often employed when a problem is large, urgent or difficult to overcome.**

To facilitate adoption of the technology, we recommend the Government supports companies such as Zest Biotech that are striving (without current access to funding) to develop solutions that will give farmers the tools they need to achieve emissions reductions.

**The FAO and the [World Economic Forum](#) recommend Public Private Partnerships (PPP) as an appropriate model.**

Despite the proven strengths of the PPP model, Zest Biotech has been informed that the Government does not form such partnerships. The Government may not use the term PPP but there are a number of examples of this model being employed. One example is the [Primary Growth Partnership \(PGP\) programme](#) which includes, for example, the Omega Lamb programme with Alliance Group and Headwaters New Zealand.

The Government may wish to explore this option which is often employed when the scale and difficulty of **the problem necessitates collaboration beyond the restricted scope/abilities/time constraints of government research bodies.**

PPP would seem an ideal fit given the scale and urgency of this issue and the potential benefits that could be delivered both in terms of environmental and economic advancements for Aotearoa.

References:

<https://www.weforum.org/agenda/2020/01/in-the-fight-against-climate-change-public-private-partnerships-are-the-only-way-to-go/>

<https://www.mpi.govt.nz/funding-rural-support/primary-growth-partnerships-pgps/current-pgp-programmes/>

## Conclusion

Zest Biotech recognises the risk to our company in our frank appraisal of Aotearoa's approach to agricultural GHG emissions and the Climate Change Commission's draft report. However, as a company we have spent many, many years working to bring our technology and the environmental and economic benefits for Aotearoa to the attention of decision makers. Not only have we been ignored, our technology has been undermined based, not on evidence or data, but opinion that is driven, in our view, by a flawed scientific funding model and anti-competitive behaviour.

It is clear that Aotearoa's approach to reducing greenhouse gas emissions, particularly agricultural emissions, is not working. This is becoming apparent to many working in this area and Aotearoa's shortcomings have been revealed on an international stage:

This statement by Bronwyn Hayward, a University of Canterbury political scientist who does work for the Intergovernmental Panel on Climate Change sums up the current situation:

*"I really love this country, I'm proud to be a New Zealander, but at the moment, working internationally, this is becoming embarrassing that we do not have real action on the ground and real ambition that matches the rhetoric that we set,"*

*"I think that New Zealand needs a serious reality check about our commitment to climate mitigation and adaptation. We are in danger at the moment of falling in love with our rhetoric and not actually putting any action behind it, and it's starting to show internationally."*

**We have the technology to reduce methane emissions from agriculture, Biozest was developed in Aotearoa, is manufactured in Aotearoa, is already approved by all relevant regulatory bodies, is safe to apply, has no residue issues, is registered organic and is in use on farms around Aotearoa right now. The modelling tools to measure environmental footprint and GHG reductions are available. The reductions in methane emissions are accompanied by co-benefits including nitrous oxide emission reductions, reduced nitrate leaching and increased productivity. Why has the Commission ignored this technology and how might we move forward for the benefit of Aotearoa?**