



# MILKED

WHITE LIES IN DAIRY LAND

AHIMSA FILMS PRESENTS "MILKED" A FILM BY AMY TAYLOR EXECUTIVE PRODUCERS KEEGAN KUHN SUZY AMIS CAMERON PETER EASTWOOD JAINE RAO  
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## ABOUT MILKED

Milked is a topical, feature documentary that exposes the whitewash of New Zealand's multi-billion-dollar dairy industry. Young activist Chris Huriwai travels around the country searching for the truth about how this source of national pride has become the nation's biggest threat. It's rapidly gone from a land with no cows to being the biggest exporter of dairy in the world, but the industry seems to be failing in every way possible.

Featuring interviews with high-profile contributors such as Dr Jane Goodall, environmentalist and former actress Suzy Amis Cameron

and Cowspiracy co-director Keegan Kuhn, Milked reveals the behind-the-scenes reality of the kiwi dairy farming fairy-tale, uncovering alarming information about the impacts of the industry on the environment and health, leading up to the unexpected discovery that we're on the edge of the biggest global disruption of food and agriculture in history.

An impactful global story told with a local eye, the film also points to what New Zealand and other countries can do to change their fate.

**“THE FILM  
THE DAIRY  
INDUSTRY  
DOESN'T  
WANT YOU  
TO SEE”**

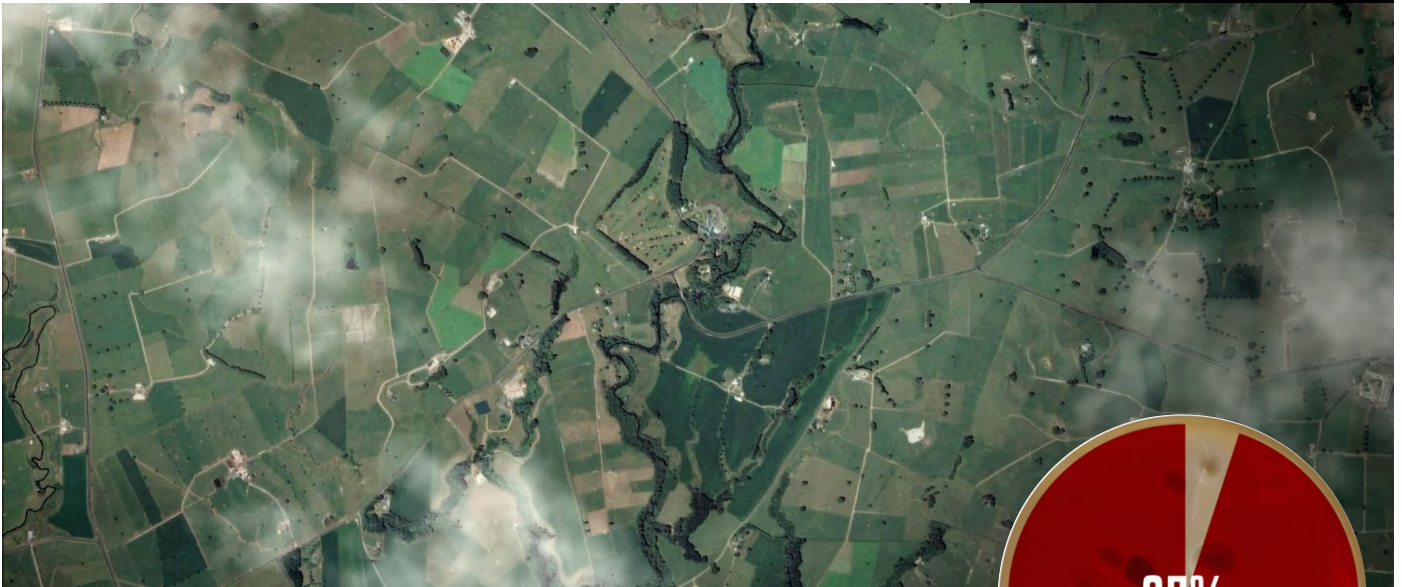
**Kip Anderson,  
Cowspiracy**



A wide-angle photograph of a dirt road curving through a vast, green agricultural landscape. The sky is filled with heavy, grey clouds, creating a dramatic and somewhat somber atmosphere. The road is the central focus, leading the viewer's eye from the foreground into the distance.

**"A POWERFUL WAKE-UP CALL THAT  
THE WORLD IS GETTING MILKED"**

**James Cameron**



## INTRODUCTION

Just over two hundred years ago, British settlers introduced the first dairy cows to Aotearoa - a land mostly covered in native vegetation and inhabited by the indigenous population of Māori.

Most of the ancient forests were cut or burnt down and almost all wetlands were destroyed to make way for farms.

Over the last two decades a “white-gold rush” prompted many kiwi farmers to convert sheep pastures to more profitable dairy farms, causing a substantial decline in the sheep population but a considerable increase in the dairy herd size.

And unfortunately, cows have a much greater environmental output.

The island nation of Aotearoa is relatively small in size, with 280,000 square kilometres of land providing a home to just over 5 million people.

The human population, however, is overshadowed by the dairy population of 6 million cows, and today more than 50% of the country’s land is used for agricultural and pastoral purposes.

**THIS ISN'T DONE TO FEED OURSELVES, 95% OF DAIRY PRODUCTS PRODUCED IN AOTEAROA ARE EXPORTED**

Indeed, New Zealand is the world's largest dairy exporter.

Fonterra, the country’s largest company, accounts for nearly a third of all dairy exports worldwide.

Fonterra is a cooperative, owned by over 10,000 farmer shareholders.

Dairy farming dominates New Zealand’s economic, political, social and physical landscapes.

Scientists warn that we would need at least 5 earths by 2050, if everyone on the planet were to consume as much dairy and meat as countries such as the United States, which consumes a similar amount to Aotearoa

With global demand for food expected to double by 2050, what are the impacts of this sizeable industry?

# IMPACTS

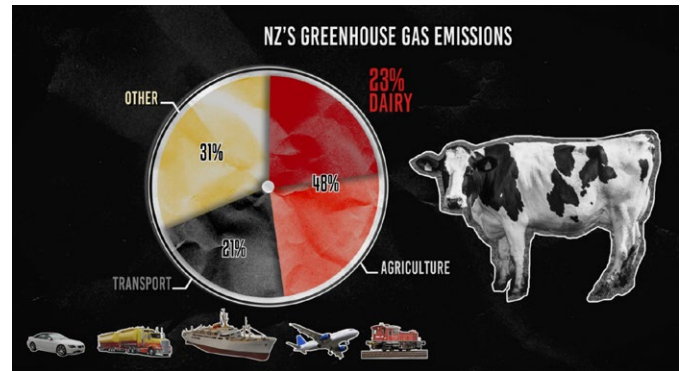
## ENVIRONMENTAL IMPACTS

Whilst almost all dairy produced in New Zealand is consumed outside of the country's borders, the ecological burdens of the dairy industry are entirely shouldered by this small nation's environment and citizens.

According to the Environment Aotearoa 2019 report produced by the New Zealand government,

**THE DAIRY INDUSTRY IS THE COUNTRY'S BIGGEST CLIMATE EMITTER, EMITTING MORE GREENHOUSE GASES THAN THE ENTIRE TRANSPORT SECTOR.**

Not only that, but the dairy industry is also the biggest water polluter, and a major stressor for biodiversity and soil health.



## WATER

### Pollution of H2O

Māori see the living world as network of relationships in which humans are neither superior nor inferior to any other life form.

Each waterway has its own mauri, or life force, creating a deep connection between Māori people and the natural environment.

**"Ko au te awa, ko te awa ko au"**  
*I am the river, and the river is me.*

So important is the "life force" of water that Aotearoa was the first country in the world to recognise in western-law a river as a living being, giving it "all the rights, powers, duties, and liabilities" of a legal person.

Despite this elevated status, today in Aotearoa 82% of waterways in pastoral farming catchments are polluted.

Nearly half of the country's waterways run through farmland and 95% of these are contaminated.

New Zealand's massive dairy herd produces over 150 million litres of nitrogen-rich urine every day.



The National dairy herd alone is producing the same amount of excrement as nearly 90 million people.

This voluminous animal waste production causes considerable nitrate contamination of the country's waterways. And it is not the only agricultural pollutant. The other is industrial fertilizers.

Growing grass faster with synthetic, nitrogen-rich fertiliser has allowed more cows to be farmed, which in turn has led to increased yields and the overall scaling up of dairy production.

**SINCE 1990, THE AMOUNT OF NITROGEN APPLIED TO NEW ZEALAND SOILS HAS INCREASED OVER 600%.**

Cow numbers surged from 2.8 million to 3.9 million from 1995 to 2005, largely due to the increased use of farming inputs.

Contaminated nitrate-rich groundwater seeps into river systems, causing eutrophication – uncontrolled plant and algal growth which compromises oxygen levels, harming fish and suffocating aquatic life.

And it's not just the fauna and flora that are negatively affected by this water pollution – human health is also at risk.

A 2021 report released by the Universities of Victoria and Otago says that the health of 800,000 New Zealanders could be affected by the contamination of drinking water by nitrates.

Nitrates may contribute to the burden of cancer in New Zealand. According to international studies, nitrate in drinking water is believed to increase the risk of colon and rectal cancer, even if the concentration is much smaller than the 'safe' limit.

The current maximum level in New Zealand is 11.3mg/L but worryingly, the associated increased risk of colorectal cancer appears to start as low as 0.87mg/L.

In dairy intensive areas such as rural Canterbury, pregnant mothers have been advised by local health officials to have their private drinking water tested, due to the risk of "Blue Baby Syndrome" from nitrate contamination.

And because of their long-lived impacts, this nitrate pollution poses environmental and health risks for many years to come, affecting not just the present population but future generations as well.

**“IF NITRATE TURNED OUR RIVERS RED, YOU KNOW, WE WOULDN'T HAVE THE PROBLEM. IT'S ONLY BECAUSE PEOPLE CAN'T SEE IT. THEY DON'T KNOW IT'S THERE.”**

**Dr Mike Joy,  
freshwater  
ecologist**



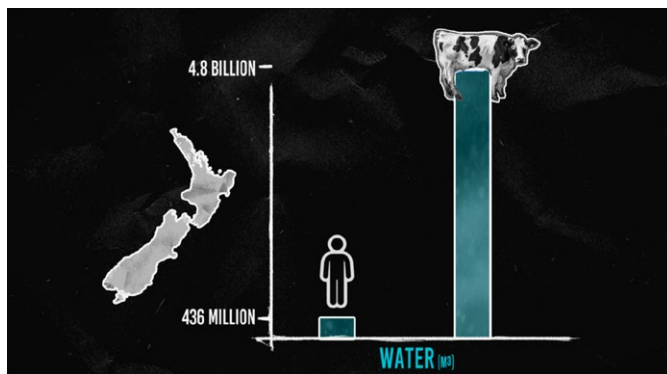
## Consumption of H2O

Not only does it appear that the dairy industry is a large-scale polluter of water, but it's also a considerable consumer.

For example:

- it takes 1000 litres of water to produce only 1 litre of milk.
- it takes 4750 litres of water to produce 1 kg of milk powder.
- it takes 5060 litres of water to produce 1 kg of cheese.

Dairy foods are incredibly thirsty in terms of their water footprint.



The last calculated annual figure for water consumption by the dairy industry was 4.8 billion cubic metres of water, which is 11 times the water use of the human population.

The more water we take out of our rivers for irrigation, the less ability our rivers have to do what they would naturally do - such as wash out sediment and algae and provide habitat for fish and macro invertebrates.

Entire rivers are now drying up during the summer season, and the cause is suspected to be big irrigating dairy farms extracting too much water.

**“WATER IS GOING TO BE THE NEXT GOLD. THE WATER IS THE LIFE FORCE. AND IF WE DON'T LOOK AFTER THE WATER, THEN ALL OF US WILL PERISH.”**

**John Tiatoa,  
Lake Omapere Trust**





## SOIL

When we consider that the average dairy herd size is 400 cows, and the average weight of one cow is more than half a tonne - this adds up to several hundred tonnes of livestock in each herd pressing down on the soils of Aotearoa.

Dairy farming is associated with soil compaction, soil erosion, soil contamination and damage to soil structure.

One of the key findings of a 2018 environmental report published by the Ministry for the Environment was that New Zealand's soils are greatly affected by erosion and intensive agriculture.

The report found that every year, the country is losing 192 million tonnes of soil, almost half of which is from pasturelands.

**"IT'S ALL ABOUT  
DESTROYING OUR NATURAL  
CAPITAL, WHICH IS THE  
EXACT OPPOSITE OF WHAT  
WE SHOULD BE DOING."**

**Peter Fraser**



## CLIMATE CHANGE

New Zealand's dairy industry states that it is one of the most carbon efficient in the world, 30% - 50% more efficient than the global average and that its milk product has a uniquely low-carbon footprint.

But it is misleading to compare the carbon footprint of New Zealand's dairy industry to the global average, because the global average is greatly skewed by developing nations whose carbon footprints are much higher.

New Zealand's carbon efficiency should only be comparable to other Industrialised Nations. When this comparison is made, New Zealand's carbon footprint is similar to other dairy producing regions such as Ireland and Australia.

Companies such as Fonterra also promote products such as their "carbon zero milk" but this production line is currently less than 1% of their total milk production, and its neutral carbon footprint is achieved by buying carbon offsets, not by actual emission reductions.

On closer examination, it becomes apparent that the carbon efficiencies published and promoted by the dairy industry are tinted with greenwashing, and studies are often industry funded, bringing into question the independence of their results.

### **So what is really going on?**

The reality in New Zealand is that agriculture is responsible for almost half of the country's greenhouse gas emissions.

The dairy sector is the single largest polluter, emitting more than the entire transport sector.

And although the dairy industry claims to produce the most sustainable milk in the world, the government's greenhouse gas inventory shows that the total emissions of this industry have rocketed by 132% in the last 30 years.

The dairy industry produces greenhouse gases in several ways.





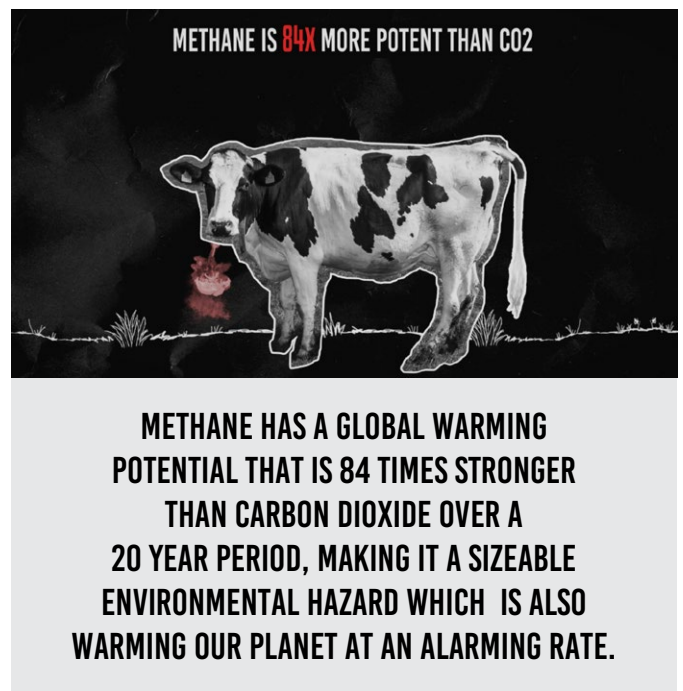
## Greenhouse Gases

Data from the Ministry of Business, Innovation and Employment in 2013 showed that Fonterra burned 410,000 tonnes of coal to turn liquid milk into milk powder, whilst the dairy industry as a whole used 512,811 tonnes of coal. More recent data shows that Fonterra alone is burning over 500,000 tonnes of coal per year.

Given that 1 tonne of coal produces 2.86 tonnes of carbon dioxide, this industrial scale pollution is having significant climate impacts.

Dairy farming produces two greenhouse gases which are far more potent than carbon dioxide. Nitrous Oxide and Methane.

Nitrous oxide comes from cow manure and urine, and from the nitrogen-based fertilizers prevalently used in the industry. It has a heating potential 300 times more powerful than carbon dioxide, warming the Planet more intensively and for a much longer time, as it has a more enduring lifespan in our atmosphere.



This powerful greenhouse gas comes from the rumen, which is the first of the four sections in a cow's stomach, and most of it is burped – despite folklore about gases from the other end.

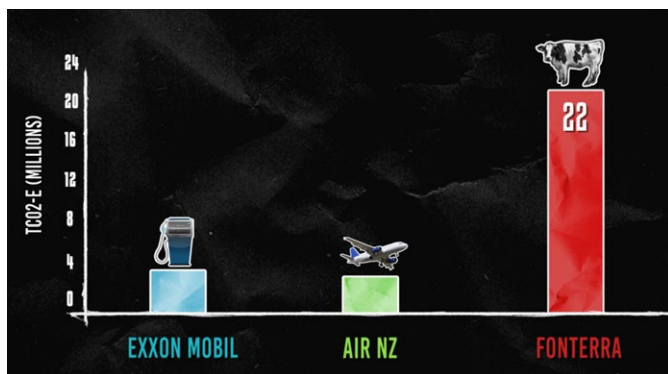
Cows burp approximately every 90 seconds and it's estimated that globally, cows release 150 billion gallons of methane, every single day.

## New Zealand's Dairy Emissions

Grass fed cattle produce 4 times more methane than grain-fed cattle, according to studies, so having a pasture-grazed dairy industry does not help New Zealand's climate impacts - in fact, chances are it makes them considerably worse.

New Zealand has the highest per capita (i.e. per person) methane emission rate in the entire world, producing 6 times more methane than the global average.

Of all companies in New Zealand, the biggest greenhouse gas emitter is Fonterra.

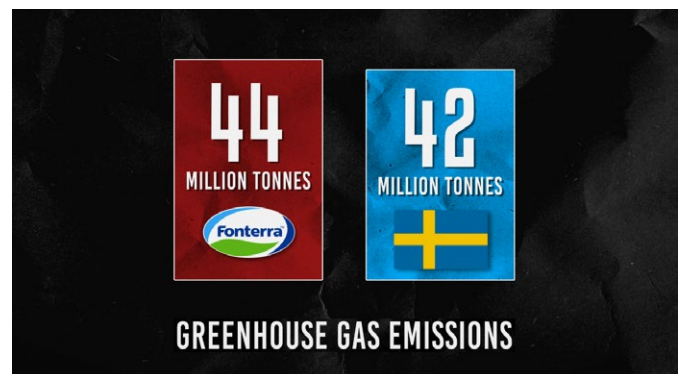


Fonterra states they produce 22 million tonnes of greenhouse gasses every year.

However, in a recent report "Milking the Planet" by the Institute of Agriculture & Trade Policy, Fonterra was found to be massively underreporting their emissions.



The researchers estimated that Fonterra's emissions were in fact over 44 million tonnes of greenhouse gas



If this is the case, Fonterra alone produces more greenhouse gases than the whole of Sweden, a country with twice the population of Aotearoa.

## Zero Carbon Bill

In 2015, a landmark international accord called the Paris Climate Agreement was adopted by nearly every nation in the world.

Its goal is to substantially reduce global greenhouse gas emissions in an effort to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels.

As part of its climate commitments, in 2019 the New Zealand government announced its goal to be carbon neutral by the year 2050, which could be considered positive news.

Yet this Zero Carbon Bill has one glaring loophole - there is an exception for methane from farm animals - with only a 10% reduction of methane emissions required by 2030.



**DESPITE THIS LOW THRESHOLD, FONTERRA ARE FORECASTING NO REDUCTION AT ALL IN METHANE EMISSIONS.**

## Is regenerative agriculture a solution?

Anecdotal evidence shows that the robust, healthy ecosystem resulting from regenerative agriculture allows for land to support greater variety of crops and better crop yields.

Regenerative farming involves using a system of land management practices that create self-sustaining cycles rather than one that relies heavily on inputs such as fertilizers and pesticides.

Through these methods, it is believed that regenerative agriculture markedly improves the most vital component of the farm ecosystem which is its soil fertility, and this in turn improves other aspects such as water management and the resilience of the ecology of the farm as a whole.

Whilst the practices grouped as regenerative agriculture improve soil health and yield valuable environmental benefits, the belief that it can achieve large-scale emissions reductions is debatable, particularly if livestock remain components of the farming system.

Researchers from the Food Climate Research Network at the University of Oxford spent 2 years analysing all the available scientific research on grass-fed livestock sector emissions and their potential impacts on carbon sequestration.

According to the FCRN,

**CARBON STORAGE IN PASTURES CANNOT COMPENSATE FOR THE ANIMALS' OWN CLIMATE IMPACTS, LET ALONE THOSE OF OUR INDUSTRIAL CIVILISATION.**

In other words, grazing livestock - even in a best-case scenario - remain net contributors to the climate problem.

Growing crops using regenerative practices is more ecologically sustainable and potentially also more productive, but it should not be seen as a justification for continued farming of cattle.



## DEFORESTATION

There are a lot of cows in New Zealand, so many that grazing alone does not sustain them all. Supplementary feed is needed, and the solution employed by the dairy industry is to import cheap food in the form of Palm Kernel Expeller (PKE).

Palm Kernel is a by-product of the infamous Palm Oil industry and is linked to the destruction of tropical rainforest, loss of wildlife, displacement of indigenous peoples, human rights abuses, and climate change impacts in South East Asia.

Imports of PKE into New Zealand began in 1992 with 15 tonnes, but have since increased substantially to a staggering 2 million tonnes in 2014.

Today, New Zealand is the world's biggest importer of PKE, supplying 2.5 million tonnes of supplementary feed to its unsustainable population of dairy cows.

This tiny island nation imports more PKE than the 27 countries of the European Union combined.



### PALM KERNEL MEAL IMPORTS

COUNTRY	1000 MT
1. New Zealand	2 500
2. EU-27	1 575
3. Korea, Rep of	950
4. China	850
5. Viet Nam	515
6. Saudi Arabia	450
7. United Kingdom	315
8. Thailand	235
9. Japan	190
10. Turkey	150

## BIODIVERSITY LOSS

The destruction of wild habitat for farming and development is resulting in what many scientists consider to be the sixth mass extinction of life on Earth, in its four-billion-year history.

About half the Earth's animals are thought to have been lost in the last 50 years alone and due to the enormous land usage, animal agriculture has a significant role to play in this vast loss of biodiversity.

A 2018 study of all life on Earth revealed a stark picture -



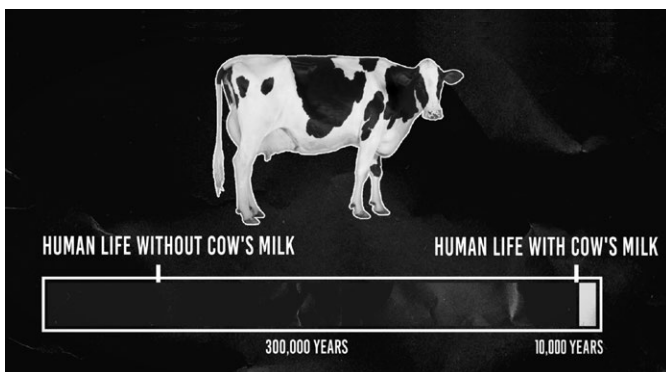
## HEALTH IMPACTS

Kiwis are big consumers of dairy, having one of the highest rates of domestic milk consumption in the world.

Our consumption of dairy and other animal products is generally motivated by the three big “N”s - our perception that it is Normal, it’s Necessary and it’s Natural.

## IS IT NORMAL?

Studies of ancient texts and pottery fragments suggest that humans started using domesticated cattle for milk between 6000 and 8000 years ago.



Although this sounds like a long time, it’s a very short period in relation to the full history of human existence. If we represented our existence as a 24-hour clock, we would have begun dairy farming less than 30 minutes ago.

Māori have historically been known as some of the tallest, strongest, fittest people on the planet. And yet the consumption of dairy was never part of their dietary patterns.

Chronic disease was almost unheard of before colonization, but today Māori people suffer from disproportionately higher rates of diabetes, heart disease and cancers.

We may perceive it to be normal to consume cow’s milk, but scientific studies have shown that over two thirds of the world’s population cannot digest the lactose in milk.

Infants and children produce enzymes that break down lactose, the sugar found in breast milk and cow’s milk, but as we grow up, many of us lose this capacity.

The minority who are not lactose intolerant are typically of Northern European descent—a culture that domesticated and milked cattle up to 8,000 years ago.

Studies in New Zealand suggest, however, that people of Māori and Pacific origin have a higher prevalence of lactase deficiency than New Zealand Europeans.

**Globally, about 65% to 70%  
of adults are lactose intolerant.**

**Lactose intolerance varies widely  
between different ethnic groups:**

**95% of Asian people  
75% of Afro-Caribbean people  
50% of Mediterranean people  
10% of Northern European people**

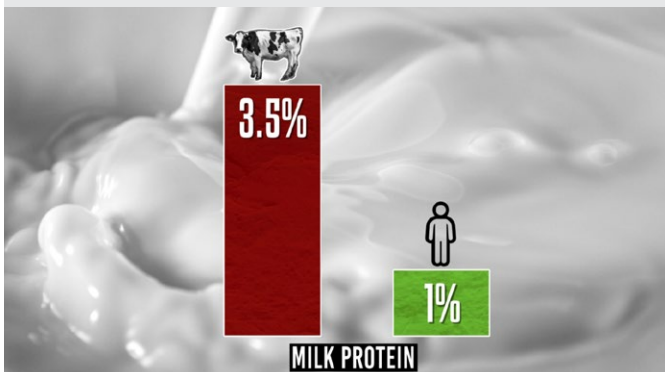
## IS IT NATURAL?

We are the only mammal to continue drinking milk throughout our lifetimes, years after our natural weaning age which is between 2 and 3 years old

The milk we continue to consume long after our weaning age, is not even our own milk. We are the only mammal to continuously drink the milk of another species.

Despite our obsession with protein, we should take note that human breast milk has the lowest amount of protein in any mammal's milk known to science.

**THE NUTRIENT COMPOSITION OF COW'S MILK DOES NOT CLOSELY RESEMBLE HUMAN MILK, BEING 39% HIGHER IN SATURATED FATS, 190% HIGHER IN PROTEIN AND HAVING NEARLY 4 TIMES MORE CALCIUM THAN HUMAN MILK.**



And with these differences come a host of illnesses and ailments.

Not only is the nutrient composition of cow's milk different from human milk, but commercial dairy comes packaged with undesirable extras; namely anti-biotics and pus.

Approximately a quarter of all dairy cows in New Zealand suffer from mastitis during milking season, a painful udder infection which is routinely treated with antibiotics.

Despite attempts to control them, these infections cause white blood cells also known as "somatic cells" or more commonly known as "pus", to leach into the milk.

For the New Zealand dairy industry, guidelines allow for 1 litre of milk to have up to 400,000,000 pus cells before the litre of milk is considered unfit for human consumption.





## IS IT NECESSARY?

There is a vast body of evidence which suggests that dairy is not beneficial to human health and in fact is associated with many of our most common diseases.

### Children and Dairy

We are led to believe that dairy is an important part of childhood nutrition, but in reality, it is associated with a range negative health outcomes.

For example, Cow's Milk Allergy (CMA) is one of the most common food allergies found in children, and can cause respiratory symptoms such as wheezing, coughing, shortness of breath, runny nose, and gastrointestinal (GI) problems.

Studies have found frequent consumption of dairy products to be associated with increased respiratory tract mucus production and higher risk of asthma in infants and children.

Dairy consumption has also been linked to childhood constipation, and in adolescence, the development of acne. Whereas acne is virtually never found in cultures that do not consume cow's milk.

Recent studies have suggested that various proteins found in cow's milk may trigger the

childhood-onset of Type 1 diabetes, and that elevated concentrations of casomorphins from cow's milk may contribute to the development of autism in children.

### Adults and Dairy

In order for cows to make milk, they are made pregnant and give birth to a baby so that their bodies begin to lactate.

In addition, the dairy industry re-impregnates female cows whilst they are still lactating from the birth of their previous baby. This means most dairy cows are both pregnant, and lactating, at the same time.

As a result, commercial cow's milk contains large amounts of pregnancy hormones, such as oestrogens and progesterone.

Which may explain why the consumption of dairy products has been linked to higher risk for various cancers, especially to hormone sensitive cancers of the reproductive system.

Multiple studies have shown that the consumption of milk and dairy products increases the risk of prostate cancer.

Not only that, but studies have found that if a man is diagnosed with prostate cancer and continues to consume dairy products, he has a much higher overall risk of mortality.

In a shocking discovery, a recent report from the Prostate Cancer Foundation of New Zealand identified that Māori men are 72% more likely to die of prostate cancer once diagnosed, than their non-Māori counterparts.

**“IT'S NOT  
BENEFICIAL,  
NOT REQUIRED,  
ASSOCIATED WITH  
LOTS OF DISEASES.  
THE SCIENCE IS  
THERE. IT'S JUST  
WE NEED PEOPLE  
TO CATCH UP WITH  
THE SCIENCE.”**

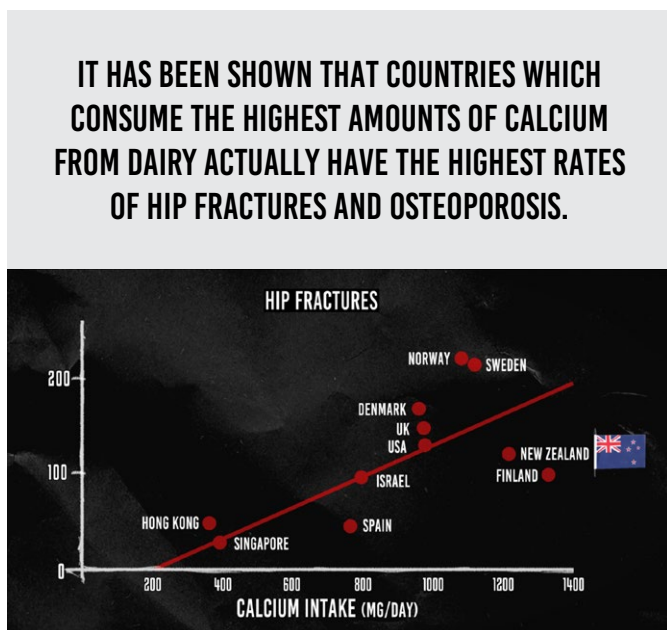
**Dr Mark Craig**

Men are not the only ones at risk.

Recent research in 2020 funded by the National Cancer Institute, the National Institutes of Health, and the World Cancer Research Fund, found that women who drank 2-3 cups of dairy milk were associated with an 80% increased chance of breast cancer.

One cup per day increased the risk by 50% and those who consumed as little as 1/4 to 1/3 cup of cow's milk per day had a 30% increased chance for breast cancer.

The belief that we need to drink milk for strong bones is born more out of marketing by the industry itself, than medical science.



A 20-year study that followed over 100,000 men and women discovered that higher milk intakes led to an increased risk of death, and an increased risk of fractures in women.

Milk and other dairy products are the top source of saturated fat in the typical western diet, contributing to heart disease, type 2 diabetes, and Alzheimer's Disease.

Why don't our doctors tell us about these risks to our health and the health of our families?

The unfortunate reality is there is a significant lack of nutritional education in medical training across the globe.

As a result, medical practitioners often refer to their Governments National Nutrition Guidelines for recommendations, but is this an independent source of accurate nutritional information?

How can it be, if the National Nutritional Guidelines are vetted and influenced by the animal agriculture industries themselves, who have a vested interest in increasing profits and market share.

**“NOW, ONCE YOU REALIZE IN NEW ZEALAND, THAT 5 MILLION COWS ARE A LOT MORE IMPORTANT THAN 5 MILLION PEOPLE THEN EVERYTHING ELSE IN NEW ZEALAND POLITICS SUDDENLY MAKES A LOT OF SENSE, BECAUSE THE COWS ARE MORE IMPORTANT THAN WE ARE.”**

**Peter Fraser**



## ZOONOTIC DISEASE

Whooping cough, tetanus, polio, AIDS and the seasonal flu that circulates every winter, all came from animals. Even measles is believed to have evolved in an environment where cattle and humans lived in close proximity.

These are called Zoonotic Diseases - diseases which are transmitted from animals to humans. And they are much more common than we may realise.

Six out of every ten diseases in humans, and three-quarters of the world's emerging infectious diseases, are zoonotic - due mainly to the trade in wildlife and factory farming.

The recent infectious disease outbreaks such as SARS, MERS and Covid-19 are just a few more in a long line of zoonotic diseases. But what concerns scientists is that they are now emerging with increasing frequency.

Industrial scale livestock farming leads to animals being kept near each other and often in less-than-ideal conditions, which in turn creates a fertile breeding ground for another mutant zoonotic virus to emerge.

A 2020 United Nations report stated that the Number 1 risk factor for the emergence of zoonotic diseases is the increased demand for animal protein.

**A 2020 UNITED NATIONS REPORT STATED THAT THE NUMBER 1 RISK FACTOR FOR THE EMERGENCE OF ZOONOTIC DISEASES IS THE INCREASED DEMAND FOR ANIMAL PROTEIN.**

Reducing our consumption of dairy and other animal-based foods is a risk-mitigation strategy for zoonotic diseases globally.



## SOCIAL IMPACTS

### FARMERS

So often the focus of sustainability is on the environment, but there is a glaring gap in the conversation around the sustainability of dairy farming, for the farmers themselves.

Failure from industry leadership has led Kiwi farmers down a path of destructive farming practices and intensification.

Today, dairy farmers are operating in a challenging environment with unstable weather patterns, changing industry regulations, negative perceptions of dairying in the media and with the public, high levels of debt and financial pressures.

And not least of all - the all-consuming milestone of annual milk production.

In 2017, an estimated 180,000 animals were culled on more than 250 farms in a bid to stop an outbreak of *Mycoplasma bovis* in New Zealand.

A subsequent study by the University of Otago found that the governments "badly planned and poorly executed" handling of this crisis inflicted significant and lasting trauma on farmers whose stocks were culled.

A recent DairyNZ report found 62% of dairy farmers said they, or someone on their farm, had experienced mental health issues in the past 12 months.

**IN THE LAST TEN YEARS IN NEW ZEALAND, 167 FARMERS HAVE TAKEN THEIR OWN LIVES**  
(2011 - 2020 inclusive)

Mental health conditions, including anxiety and depression, may be one of the biggest social and sustainability issues faced by the dairy industry.

## FOREIGN MARKETS

Targeting the Asian market with its considerable population growth and rising incomes, seems to be an obvious business choice for the dairy industry of New Zealand.

However, for Asian populations the consumption of cows milk and related products was never part of their

cultural diet, which is why there are lactose intolerance rates of almost 100% in many parts of Asia.

Whilst exporting dairy to Southeast Asia may be a financially strategic move for New Zealand's largest industry, is it in the best interests of the populations on the receiving end?

## FEEDING THE WORLD

The World Health Organization reports that 821 million people (roughly 1 in 9) currently suffer from hunger.

Yet there are enough global calories to feed 10+ billion.

If we are producing enough calories to feed more than 10 billion people, and we have a current population of 8 billion, why are over 800 million people suffering from hunger?

According to the FAO, we are feeding half the world's grain crop to animals raised for meat, eggs, and milk instead of directly to humans, which is a significant waste of natural resources, including fossil fuels, water, and land.

More grain today is grown to feed our livestock than to starving people.

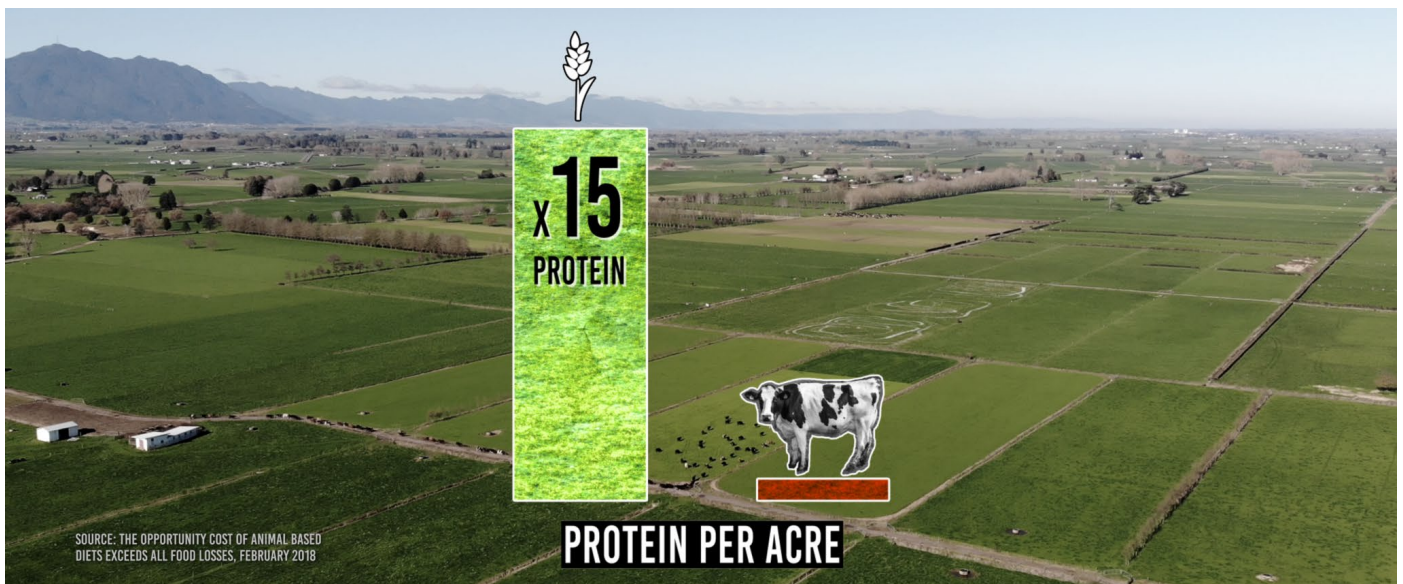
Livestock are extremely inefficient converters of food. That is, they consume much more food than they produce (in both calories and protein).

**WE ARE CURRENTLY USING OVER 3/4 OF THE EARTH'S AGRICULTURAL LAND TO RAISE LIVESTOCK, AND TO GROW FEED TO GIVE TO LIVESTOCK. AND YET LIVESTOCK ONLY PRODUCES 18% OF THE WORLD'S CALORIES AND 37% OF TOTAL PROTEIN.**



Livestock are highly resource-intensive, requiring more land, water, and energy than eating plant-based foods directly.

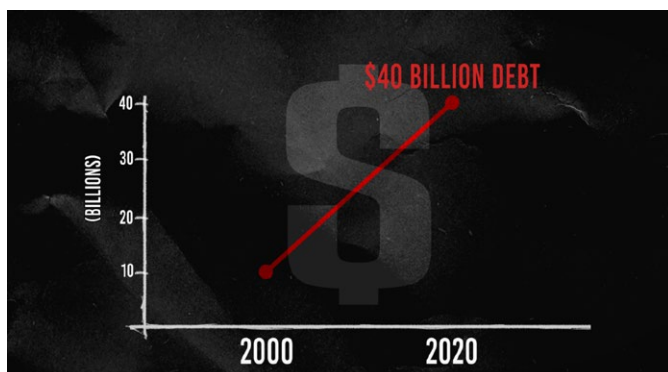
According to a 2018 report by the Proceedings of the National Academy of Sciences, 1 acre of land can produce 15 times more protein from plants, than the same area of land used for farming animals.



## FINANCIAL IMPACTS

The Ministry for Primary Industries has said that the number of New Zealand dairy farms experiencing financial distress is increasing.

Dairy debt has gone up from \$10 billion in 2003 to a debt of around \$40 billion today, which is a 400% increase in debt.



According to MPI, the ratio of non-performing loans in the dairy sector has doubled over the past three years from 2016 to 2019.

But it's not just the dairy farmers who are suffering financial impacts - unbeknown to them, the people of Aotearoa are footing a large bill too.

In 2014, researchers conducted the first nationwide assessment of the externalities of the dairy industry - the costs that are borne by the public, rather than industry itself.

A conservative estimate of the costs of repairing the damage from dairy farming could be as high as \$20 billion.

**“WHEN YOU  
POLLUTE THE  
WATER AND YOU  
POLLUTE THE SOIL,  
IT REALLY LIMITS  
YOUR OPTIONS FOR  
THE FUTURE. IF THE  
TRUE COSTS WERE  
BEING PAID THEN  
WE WOULDN'T BE  
DOING DAIRY IN  
THIS COUNTRY.”**

**Dr Mike Joy,  
freshwater ecologist**

## IMPACTS ON THE ANIMALS

Cows are often perceived as being simple creatures with limited social structures, but evidence conclusively proves that this is not the case.

Cows are curious, tactile and sensitive beings who would naturally live together in small herds, form close friendships and develop a social hierarchy, having a capacity to recognise more than 100 members of their own herd.

Sadly, these sweet, peaceful beings are exploited in many ways.

When we consume milk, we are largely unaware of the processes which took place between the farm and our fridge.

Starting with the reality is that every dairy cow is a mother.

## MOTHERS

From around 15 months old, a female dairy cow or a "heifer" is artificially inseminated (AI) in order to make her pregnant. A dairy cow is pregnant for 9 months, just like us.

After giving birth to her baby, like all other mammals a dairy cow's body produces milk in order to feed her newborn. This milk is then taken for human consumption, and the calf who was born was effectively a "waste product".

As it is common practice in the industry to re-impregnate cows a few months after they have started milking, for seven months of every year these cows face the dual burden of producing vast quantities of milk and nurturing a growing foetus.

The milk yield of dairy cows has increased from an average of 3750 litres per cow in the 1970s, to almost 8000 litres in 2019. The doubling of milk yield over the last 40 years is due to selective breeding and intensification of herd management.

This cycle of impregnation, calf removal and milking is repeated 3 or 4 times, on average, in a cow's lifetime.



**COWS HAVE A NATURAL LIFE EXPECTANCY OF ABOUT 20 YEARS BUT BECAUSE OF THE EXTREME STRAIN ON THEIR BODIES, DAIRY COWS ARE TYPICALLY CONSIDERED 'SPENT' ONCE THEIR MILK YIELD DECLINES AND THEY ARE SENT TO SLAUGHTER AS YOUNG AS 5 OR 6 YEARS OLD, TO BE SOLD AS CHEAP BEEF.**

Cattle raised in New Zealand for meat and milk production are killed in enormous numbers. According to the Ministry of Primary Industries (MPI) statistics, in the year ending September 2020 more than 4 million cattle were slaughtered in New Zealand.

And more cattle are being killed over time, due to the intensification of dairying.

## BABIES

Because we want their milk, we cannot afford for baby cows to suckle from their mothers and therefore the two are separated, usually within the first 24 hours, and the mother cow is then milked mechanically so that we can acquire her milk.

In 2020, 4.9 million dairy calves were born in New Zealand - almost the equivalent to the human population of Aotearoa. DairyNZ estimates that of those:

- 196,000 were born dead or died shortly after birth.
- 1.3 million calves were sent to the beef industry.
- 1.4 million calves were kept by dairy farmers to replace the older cows who are "spent" and sent to slaughter.
- 2 million calves were killed within a week of their birth.

These are called "bobby calves"

A bobby calf is a baby cow younger than 30 days old that is deemed to have no future value, so rather than spending money to raise this calf, he or she is killed. Generally, it's the males, because they cannot be used for milking.

The killing of 2 million bobby calves in New Zealand typically happens over a 2-month period every year.

On average, 33,360 baby cows are killed each day, during a six-day working week.

**"YOU HAVE TO DESENSITIZE YOURSELF TO IT. IF YOU DON'T, YOU MAY END UP A SHIVERING WRECK AND UNABLE TO CONTINUE."**

**Tom Welch,  
Dairy Farmer**





# DILEMMA

To meet the increased global demand for dairy, Fonterra has predicted a 40% increase in milk production in the 10 years from 2015 - 2025.

How could this projected growth possibly be sustainable?

We must recognise that the collective pressures of climate instability, environmental degradation, adverse health outcomes, dairy herds pushed to physiological limits, social impacts and financial burden are rapidly reducing the lifespan of this industry.

Commercial dairy farming is not sustainable on multiple levels.

And a wave of change is already gaining groundswell.



## FINANCIAL IMPACTS

An agricultural disruption lies on the horizon which some believe may be the most consequential shift in food production systems that we have seen in the past 10,000 years.

A report produced by think tank RethinkX states that by 2030, demand for cow products will have fallen by 70%.

The cow as a technology, they believe, will become redundant.

Fermentation, in a similar way to which we produce beer, is going to be the new pathway to produce proteins.

Microbes are placed into a fermentation tank along with feedstock, and when the fermentation process is finished, the microbes are filtered out, leaving dairy protein behind that is identical to that found in cow's milk.

Animal-free dairy does not contain the lactose, cholesterol, saturated fat, anti-biotics and hormones typically found in cows milk.

However, it does contain the amino acids for the protein casein and therefore the health risks associated with the consumption of animal protein may still apply.

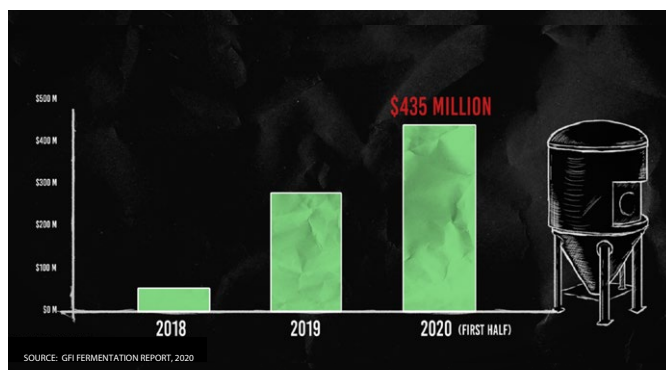
**“IT’S GOING TO BE 10 X CHEAPER THAN ANIMAL PROTEIN. COWS CANNOT POSSIBLY COMPETE WITH THIS.”**

**Tony Seba, RethinkX**

**ANIMAL-FREE MILK IS SAID TO BE IDENTICAL IN TASTE, REQUIRES A FRACTION OF THE RESOURCES AND IS 100% CRUELTY-FREE.**



This disruption is already happening, with investment in fermentation companies at the highest level ever – over \$435 million was invested in just the first half of 2020.



New Zealand's dairy exports could be wiped out without a single consumer changing their behaviour, because analysts believe this shift from animal proteins to precision fermentation proteins will be a business-to-business disruption.

When is that going to happen? The technology vs cost curve will determine that, the market will determine that, but many believe there is no doubt this industry disruption is inevitable.

# SOLUTIONS

## PLANT BASED LIFESTYLE

In 2018, the most comprehensive analysis to date on the environment and farming was published. The study evaluated the full impact of our food, from farm to fork; on land use, climate change emissions, freshwater use, water pollution and air pollution.

Published in the journal Science, the research team examined 40,000 farms in 119 countries and covered 40 food products that represent 90% of all that is eaten.

What was their conclusion? According to lead scientist Joseph Poore "avoiding meat and dairy products is the single biggest way to reduce our environmental impact on the planet."

On the other hand, diets rich in plant foods limit or exclude high greenhouse gas emission-intensive foods and have been described as critical for averting catastrophic environmental damage.

**"WE CANNOT BE HAVING THESE LAND USES WHICH ARE ALL ABOUT PRODUCING MILK OR ALL ABOUT PRODUCING MEAT, WE HAVE TO DIVERSIFY INTO PLANT-BASED PRODUCTION. THAT'S WHAT THE SCIENCE IS TELLING US."**

**Genevieve Toop,  
Greenpeace NZ**

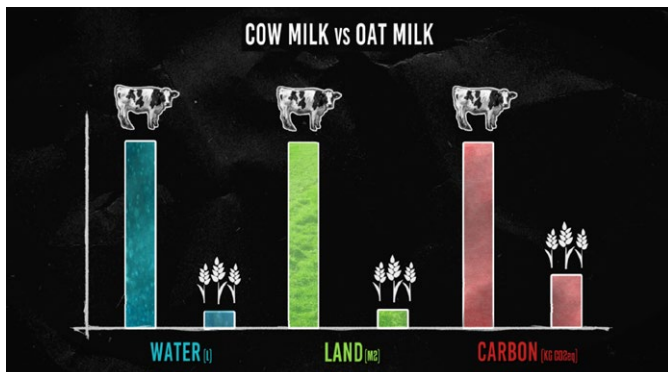


To illustrate this, consider that ...

**1 KILOGRAM OF CHEESE CREATES A STAGGERING 21 KILOGRAMS OF GREENHOUSE GAS EMISSIONS, COMPARED WITH ABOUT 1 KILOGRAM OF GREENHOUSE GAS EMISSIONS FROM MOST VEGETABLES AND OTHER PLANT FOODS.**



Consuming plant-based milks, instead of cow's milk, offers enormous environmental benefits. Take oat milk, for example, which uses 13 x less water, 11 x less land, and creates 3.5 x less carbon emissions than cow's milk.



Plant based milks use less resources, produce more protein per hectare, are more energy efficient and have a lower carbon footprint - everything is more efficient, than the milk produced from cows.

Even plant-based foods transported from the other side of the world are more carbon efficient than animal products.

## EAT-LANCET Report

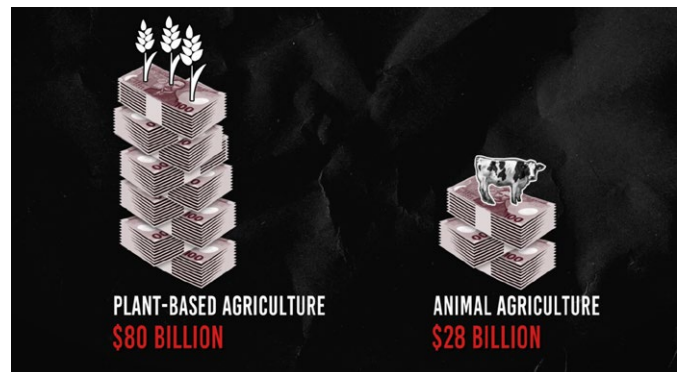
In 2019, world-leading scientists from across the globe came together to answer this question:

Can we feed a future population of 10 billion people a healthy diet within planetary boundaries?

They discovered that without a global shift to a plant-based diet, today's children will inherit a planet that has been severely degraded and where much of the population will increasingly suffer from malnutrition and preventable disease.

## Plant Rich Potential of New Zealand

A government-funded report shows that New Zealand has a huge amount of land suitable for growing crops, and potential for \$80 billion from plant-based crops, compared with only \$28 billion from animal agriculture.



Prioritizing plant-based foods has the potential to provide substantial climate and health gains for the country, including diet-related emissions savings of over 40%, along with health care savings of up to NZ\$20 billion over our lifetime.



## HELPING FARMERS

Given the risks, pressures and sustainability issues surrounding dairying, some farmers may be considering a change.

Presenting farmers with economically viable alternatives to dairy is vital for their livelihood. If farmers have choices which are financially feasible and practical, they may have an easier decision to make.

This process requires compassion and understanding, acknowledging the important role that farmers play in our world and working together to find holistic, sustainable solutions.

### Dairy Farming to Pumpkin Seeds

Tom Welch's family had been dairy farmers since 1924 when Tom's Grandfather first took a lease on the farm. After 95 odd years, Tom and his wife Melissa began looking for an alternative crop that would eventually provide an income for their family.

This search led the Welch's to discover the potential of the humble pumpkin. A plant which grows fantastically in their region, pumpkin's produce seeds which can be used in a variety of products, including pumpkin seed flour which is excellent for gluten free baking.

Cannock Harvest is an excellent example of transforming land previously used for dairying into a future focused, sustainable business supplying a specialist product that offers a variety of market possibilities.



## Dairy Farming to Hemp

Hemp is a robust, drought resistant, competitive plant which is naturally insect resistant, grows extremely fast, sequesters more carbon dioxide per hectare than any other commercial crop and improves soil fertility with its powerful nitrogen-fixing abilities.

Hemp seeds are exceptionally nutritious, higher in protein than beef or lamb, and rich in essential fatty acids and various minerals. Hemp fibres are very long, which makes them desirable for manufacturing. Paper, rope, canvas, textiles, seals, medicines, foods are all examples of products manufactured from the Hemp plant.

From its food to its industrial uses, the hemp plant is incredibly versatile and offers immense potential for farmers, the environment and human health.

However, New Zealand's central government is hampering the progress of this industry with unnecessary costs and legislation. In order for the full potential of Hemp to be reached, a change in legislation is urgently needed.

## Dairy Farming to Organic Vegetables

Cameron Family Farms had two dairies within the farm, but in May of 2012 the owners James & Suzy Cameron, closed the dairies down and transformed their land into an organic vegetable farm, selling their products to restaurants and grocery stores.

After nearly 10 years of experimenting, they have found the sweet spot of their production line - the brassica family of kale, chard, broccoli, cauliflower, and red and green cabbages - known for their powerful anti-cancer

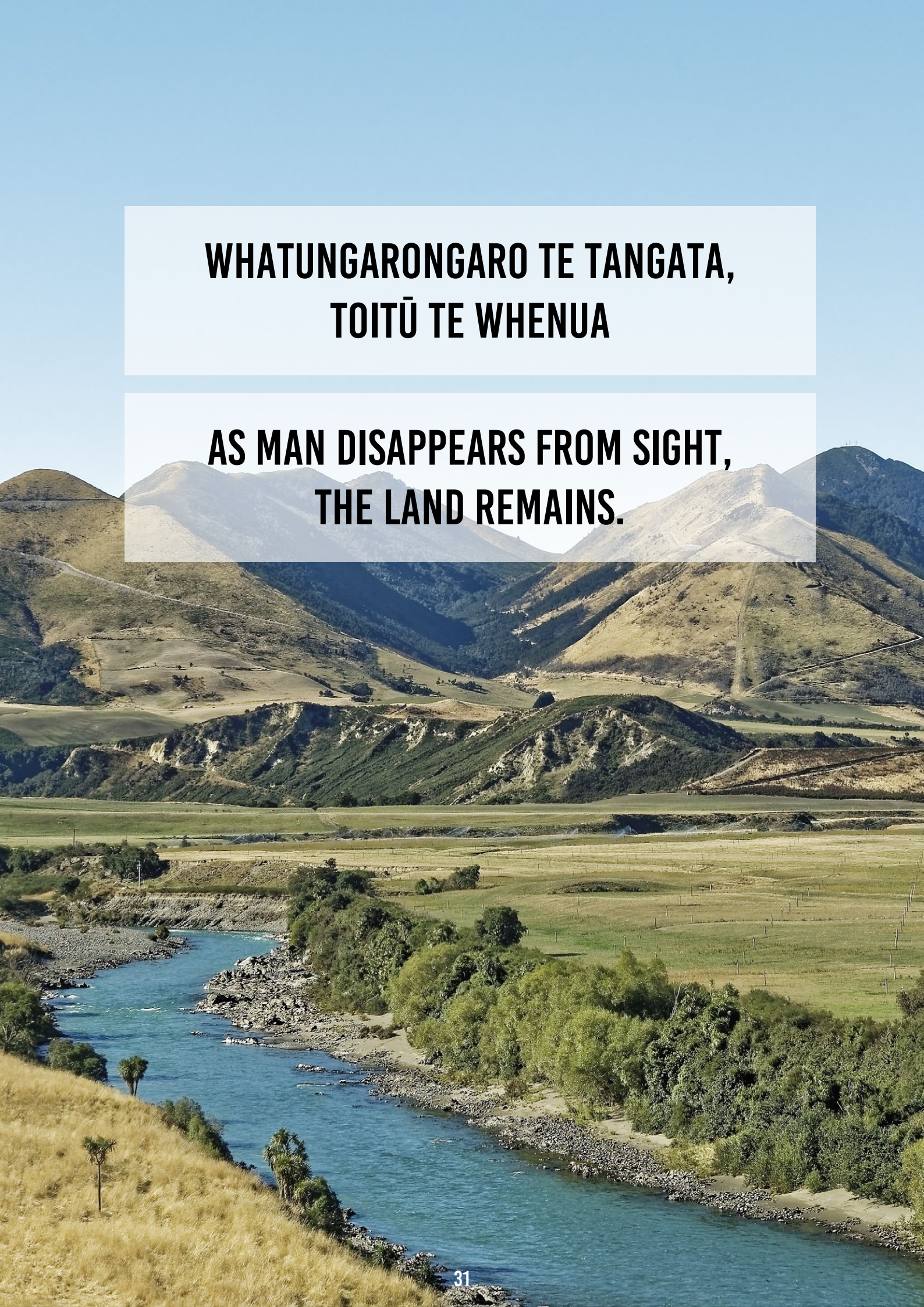
protection and multitude of health benefits.

Today, fields of these vegetables cover the Cameron Farm, and the Cameron's are fast becoming market leaders in New Zealand's organic brassica production.

**“PLANT BASED  
FOOD PRODUCTS  
ARE THE LARGEST  
GROWING SECTOR  
WITHIN THE FOOD  
SECTOR AROUND  
THE WORLD.”**

**Suzy Amis Cameron**





**WHATUNGARONGARO TE TANGATA,  
TOITŪ TE WHENUA**

**AS MAN DISAPPEARS FROM SIGHT,  
THE LAND REMAINS.**

# CONCLUSION

Looking towards the future, we clearly need a different result to what we are experiencing today, and to achieve this means a seismic shift in our thinking.

The time has come to let go of the status quo, which is truly not serving us, nor the world around us.

The era of listening to evidence-based science, embracing solutions, and transforming our western relationships with our own health and the environment, is upon us.

This is true not just for Aotearoa, but for the Global Community as a whole.

## SOLUTIONS

1. SUPPORTING FARMERS TO TRANSITION OUT OF DAIRY
2. REWILDING THE LAND WITH NATIVE SPECIES
3. CHOOSING PLANT-BASED FOODS

**“WE ALL EACH HAVE A RESPONSIBILITY BECAUSE EVERY DAY WE LIVE WE MAKE SOME IMPACT ON THE PLANET. WE HAVE A CHOICE AS TO WHAT SORT OF IMPACT WE’RE GOING TO MAKE.**

**AND IF BILLIONS OF PEOPLE MAKE ETHICAL CHOICES EVERY DAY, EVEN SMALL ONES, THAT’S GOING TO LEAD TO CHANGE. AND EVENTUALLY THE IMPOSSIBLE WILL HAVE BECOME POSSIBLE, AND WE’LL CHANGE THE WORLD.”**

**Dr Jane Goodall**





# MEET THE TEAM



## CHRIS HURIWAI ACTIVIST, CO-PRODUCER

(Ngāpuhi, Ngati Porou, Te tiawa) Chris Huriwai is a vegan advocate and extreme sportsman. He was the Community Youth Champion for Kaikohe's Māori health organisation: Te Hau Ora O Ngāpuhi for 7 years between 2010-2017, where he taught physical education and mentored rangatahi (young people) from primary to high schools. He's a back-to-back 3-time world champion for street unicycling and has recently moved home to Northland after working in Wellington at DCM, an organisation that assists rough sleepers and individuals who struggle to access sustainable housing. Chris is the co-founder of the animal rights project Aotearoa Liberation League. He is passionate about te ao Māori and using veganism as a decolonial tool.



## AMY TAYLOR DIRECTOR/PRODUCER/DOP

Amy Taylor studied environmental science and marine biology before completing a Postgraduate Diploma in Science Communication at the University of Otago. As an independent filmmaker, she is driven by the potential that storytelling has to open windows into different worlds, reveal the truth, and create positive change. Amy has spent over 20 years working with non-profit organizations, helping to shine a spotlight on environmental and social justice issues. Combining her love of the natural world with a creative skill set, she focuses on stories exploring connections between people and nature. Her first feature-length documentary, *Soul in the Sea*, premiered at NZIFF, won awards internationally, and was nominated at the prestigious Jackson Hole Wildlife film festival. Amy is the owner of Ahimsa Films. She lives with her husband and son in the Coromandel Peninsula.



## SUZY AMIS CAMERON EXECUTIVE PRODUCER

A noted environmental leader, business pioneer, mom of five and grandma, Suzy Amis Cameron is committed to caring for our wild, living Earth, with a focus on plant-based food to address climate change. She is the author of *The OMD Plan: Swap One Meal a Day to Save your Health and Save the Planet* (Simon & Schuster) and the founder of the OMD Movement, an advocacy group dedicated to transforming eating habits and expanding access to climate-friendly food for all. In 2005, she founded MUSE School CA, with her sister, Rebecca Amis. Additionally, Suzy is a founder of the plant-based ventures, Verdient Foods, Cameron Family Farms, Food Forest Organics and Plant Power Task Force, with her husband, James Cameron. In 2009, she launched Red Carpet Green Dress, a global sustainable fashion campaign showcasing environmentally responsible fashions in partnership with the Oscars. Suzy is also an Executive Producer of *The Game Changers*, a documentary on world-class plant-based athletes. Formerly, as an actor, she was featured in more than 25 films, including *The Usual Suspects* and *Titanic*.



## KEEGAN KUHN EXECUTIVE PRODUCER

Keegan Kuhn is the award-winning co-director of the highly-acclaimed documentary films *Cowspiracy: The Sustainability Secret*, executive produced for Netflix by Leonardo DiCaprio; *What The Health*, executive produced by Joaquin Phoenix; *Running For Good*, executive produced by James Cromwell; and *They're Trying To Kill Us*, executive produced by Billie Eilish and Chris Paul. Kuhn is the owner and operator of First Spark Media, a digital film production company tailored to creating films for social justice. Kuhn's skills as a director, producer, cinematographer, editor, animator and composer have been utilized in film subjects as diverse as modern Alaskan homesteading, gender inequality, animal rescues, Buddhism, endurance sports and environmental destruction. He is motivated by a deep desire to shed light on untold stories of the most downtrodden in society, and to raise awareness through greater visibility of social justice issues. Kuhn is the owner of the camera accessory company First Spark Gear and creator of the educational music project xTrue Naturex. He lives with his partner, Shani, in Sedona, Arizona.



## PETER EASTWOOD EXECUTIVE PRODUCER

Entrepreneur, environmentalist and plant based diet advocate. Peter spends his free time supporting New Zealand and African flora and fauna on a wide range of projects, often supporting projects that are less attractive to corporate donors. [www.tanglewood.org.nz](http://www.tanglewood.org.nz)



## NICKY TAYLOR RESEARCHER / WRITER

Equally passionate about the environment and plant-based nutrition, Nicky believes that evidence-based science supports a plant-based diet as the solution for better personal and planetary health and a sustainable future for all. Founder of The Naked Veggie educational online platform.

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TANGLEWOOD  
FOUNDATION NZ



the  
naked  
veggie



## RESOURCES

### The following reports were referenced in MILKED:

EAT-Lancet Commission on Healthy Diets from Sustainable Food Systems  
(<https://eatforum.org/eat-lancet-commission/eat-lancet-commission-summary-report/>)

Opportunities in Plant Based Foods - Protein - The New Zealand Institute for Plant & Food Research Ltd  
(<https://www.mpi.govt.nz/dmsdocument/29147-opportunities-in-plant-based-foods-protein-report>)

Environment Aotearoa 2019 (<https://environment.govt.nz/publications/environment-aotearoa-2019/>)

IATP: Emissions Impossible - How big meat and dairy are heating up the planet  
(<https://www.iatp.org/emissions-impossible>)

IATP: Milking the Planet: How Big Dairy is heating up the planet and hollowing rural communities  
(<https://www.iatp.org/milking-planet>)

The Green Protein Report: Meeting New Zealand's Climate Change Targets by 2030 through Reduced Reliance on Animal Agriculture  
(<https://www.andrewknight.info/reports/green-protein-revolution-new-zealand/>)

RethinkX: Rethinking Food and Agriculture Report  
(<https://www.rethinkx.com/food-and-agriculture>)

Reducing food's Environmental Impacts through Producers and Consumers  
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Food Climate Research Network: Grazed and Confused  
(<https://www.tabledebates.org/publication/grazed-and-confused>)

Fonterra Co-Operative Group Limited Sustainability Report for the year ending 31 July 2019  
(<https://www.fonterra.com/content/dam/fonterra-public-website/fonterra-new-zealand/documents/pdf/sustainability/2019/sustainability-report-full-2019.pdf>)

United Nations 2020 Report: Preventing the Next Pandemic: Zoonotic diseases and how to break the chain of transmission  
(<https://www.unep.org/resources/report/preventing-future-zoonotic-disease-outbreaks-protecting-environment-animals-and>)

A FULL LIST OF THE RESOURCES CITED CAN BE FOUND ON OUR WEBSITE [HTTPS://MILKED.FILM/](https://milked.film/)