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## **The Protein Debate – understanding the movement to plant-based eating**

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# PURPOSE

The purpose of conducting this research is to gain insight and a deeper understanding into our relationship with food with a focus on protein. It was aimed to improve understanding of the thought process that occurs when presented with conflicting information regarding dietary advice and the factors driving behavioural change when it comes to consuming animal or plant-based protein.

This research only brushes the surface in a human behavioural approach however it is challenging in the consideration of how non rural people perceive food and the effect of inconsistent messaging around diet. It connects the three underpinning factors which influence approach to animal protein consumption and explores the gender disparity in perception of meat.



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# EXECUTIVE SUMMARY

The rise of Veganism, and uptake of plant sourced protein in diets is seemingly under the spotlight. The valuable attributes and characteristics of protein has been recognised and sources are up for debate. Traditionally in the western world, the consumption of animal sourced protein such as meat, dairy eggs, fish have sustained and fuelled generations. However, the popularity and rise in diets centred around plant or alternative protein has become circulated. It is hard to quantify the gravity of this message and subsequent impact on animal protein production however it is not to be ignored.

The purpose of this research was to explore the rise in veganism and the factors which influence a shift in perception and behaviour when it comes to consuming protein sources.

Through a study of literature, the role of protein in our diets has been explored as well as production and consumption trends in New Zealand and globally. The relationship with protein sources and the human behavioural aspect towards varying food messages was woven into the discussion. Unstructured interviews were conducted amongst animal and plant protein producers as well as industry partners and consumers. A personal 21-day vegan trial was also conducted with observations of thought, emotions and social attitudes recorded.

The key findings centred around three influencing factors which underpin why people change their diet from animal protein sources to plant or alternative. These are: Animal Ethics, Health and the environment. Each factor is explored with emotional response knitted into the discussion. The disparity in gender was also touched on as well as the influence of information channels.

Compassion for and concern regarding the farming and rearing of animals has been a factor behind the movement towards vegetarianism for years. The application of anthropomorphism which is the attribution of human traits, emotions or intentions towards animals induces feelings of guilt around animal product consumption. Guilt is self-conscious whereas compassion is felt as an expression towards another being. The combination can lead to people eliminating animal protein sources from their diet to avoid and disassociate from these feelings. Women tend to alter their diet based on compassionate grounds more so than men. With consideration of emotions stemming from animal protein consumption, it is necessary for humanity towards animals throughout the supply chain to be shared.

Another factor is an invisible belief system supporting choice to consume animals. The rise of plant-based diets is challenging ideology which explains defensive attitudes towards plant-based eaters. The vegan trial conducted supports theories that socially, people find it confronting when others choose to deviate from consuming animal protein.

Climate change is denoted as the defining issue of our time. Science and media imply animal agriculture has a negative effect on environment and is not sustainable. Overwhelming insignificance in the face of this problem leads to utilising food as a mechanism of control alleviating guilt and stress associated with degradation of natural environments. Disconnection with farming and food production allows room for people to transposition global environmental issues arising from animal protein production to New Zealand pastoral farming.

Health is where people are receiving mixed messages and where the channel of information becomes so important. The medical community have linked red meat to non-communicable diseases. The accuracy of findings in this space are questionable due to lifestyle factors and meat quality, however the message is enough to tarnish red meat protein sources. In contrast, plant and alternative protein are perceived as natural and healthy which is misleading based on various additives and intensive manufacturing processes.

Recommendations have arisen in the form of further questions and consideration for the animal protein industry, its producers and marketers.

### **Focus on the Three Pillars**

A focus on eliminating concerns or stress points regarding food production such as impact to environment and animals will lead to positive eating experiences. Industry, marketers and food producers need to acknowledge, understand and address the factors behind a shift to plant based diets. An option could be to partner with plant-based producers or have plant-based product offerings to extend branding and increase consumer choice. All food producers and marketers need to ask the question: *How does what and how we eat make us feel?* The psychological affect and relationship people have with food has a huge bearing on health and wellbeing.

### **Extend Dietary Guidelines**

Existing diet guidelines are centred around physical health however an extension to address stress associated with diet labels/terminology and restrictive eating would be beneficial to consumers. Eliminating mixed messages from the health sector and food producers would reduce confusion. Through identifying and targeting stress factors, industry can enhance a positive relationship with food, which is imperative to health.

It is important to acknowledge that this research only brushes the surface of several facets relating to factors driving dietary change away from animal protein consumption. People are guided by their emotions and there is a gender differentiation response to food messaging.



# METHODOLOGY

The methodology used for this research report included an exploratory literature review followed by unstructured interviews of key stake holders and participatory action research.

The literature review sourced material from scientific reports, opinion pieces and media with a national and international perspective. It provided the foundation for discussion points raised during interviews and instigated further questioning.

The unstructured interview discussion was based on findings from the literature review. Responses were grouped into key areas and themes identified within these.

The participatory action research was conducted as a 21-day vegan dietary trial with a focus around recording observations, physical, emotional and social with the aim of eliminating a personal bias.



# INTRODUCTION

Macronutrients can be found on food labelling and the three most common are fat, carbohydrate and protein. They are a source of energy available in food. Of the three, protein is the most popular and less likely to carry negative connotations. It is the new buzz word amongst foodies, the health conscious and fitness fanatics. It is the replacement descriptor for the nourishment from meat, dairy, eggs, fish and plants. Coupled with the rise in popularity of protein expression, is 'The Vegan movement' and 'plant-based protein'. Negativity surrounding agricultural practices and dubious health messages relating to animal sourced products has seemingly enhanced and strengthened the plant-based protein message. Global trends suggest plant-based eating is on the rise and New Zealanders are not insulated from the rest of the world. The rise of veganism and plant-based eating is happening, the reasons for this are emotionally embedded and through changing diet, people feel more connected to global issues solutions. A change in consumer preference away from animal protein products or a reduction will have an impact on the New Zealand Food and fibre sector however not necessarily a negative one. Food producers and marketers need to have sensitivity to the factors that are shifting perceptions resulting in action.

The aim of this report was to explore the factors which are driving people towards changing protein sources in their diet to improve understanding of the thought process that occurs in response to food messaging.



# LITERATURE REVIEW

## Protein

Protein is a word that is circulated in dietary discussions. Used to describe energy and fuel without attributing to a source. It can be found on food labelling and is seemingly the new 'buzz' word for health-conscious 'foodies'.

Proteins in a raw form are large complex molecules. At cellular level they carry out multiple functions in the human body.

Breaking it down further, a single protein consists of a chain of smaller units called amino acids. It is the arrangement and structure of amino acids which determine the specific role and function of the protein (Genetics Home Reference, 2020). They support all functions necessary for humans to operate as indicated by example in the table below.

Amino Acids make up proteins. There are over 500 naturally occurring amino acids in nature however the human body genetic code only registers 20. Nine of these are essential as they cannot be formed from other compounds in the body and thus must be included in our diet. The other 11 are called non-essential because our bodies can form them using other compounds available (Wikipedia, Amino Acid, 2020)

## "The diet superstar" – Dr Stacey Sims



Table 1 Role of Protein in the Human Body Sourced from Genetics Home Reference, 2020

The Role of Protein in the Human Body	
Antibody	Proteins bind to specific foreign particles such as viruses and bacteria to help protect the body
Enzymes	Carry out cellular chemical reactions. Assist in the formation of new molecules by reading the genetic information stored in DNA
Messenger	Transmit signals to coordinate biological processes between cells, tissues and organs e.g. Hormones
Structural Component	Provide structure and support to cells as well as allowing the body to move.
Transport/Storage	Bind and carry atoms and small molecules within cells and throughout the body.

## Types of Protein

Protein sources can be categorised into complete and incomplete sources of protein.

Complete sources of protein contain the essential amino acids that our bodies are unable to synthesise. Food sources for complete proteins are animal-based products, meat, dairy, fish and eggs.

Incomplete sources of protein contain only some essential amino acids, not all of them. These are typically found in plant-based food sources such as nuts, wholegrains and vegetables. Two plant-based protein sources that are considered 'complete' are soy, quinoa and hemp (NZ Nutrition Foundation, 2020).



*Figure 1 Human Amino Acid Requirements*

Amino acids are a key consideration in protein sources as they dictate the quantity and quality of the food, we need to eat to achieve dietary goals (fuel to live).

### For example

if we look to the ever-popular protein supplements supported by athletes around the world. There is one essential amino acid that has muscle building and anti-inflammatory qualities in its job description, Leucine. Whey protein is a good source of this. Soy protein also contains Leucine. The quantities you need to consume to achieve the same intake of this amino is 25g and 50g respectively

## Sources of Protein & Protein Production in New Zealand

“New Zealand’s social, environmental and economic wellbeing is linked with our ability to supply the rest of the world with protein” (Ministry for Primary Industries, 2018)

### Animal Protein Production in NZ

Animal based protein production, farming and agriculture is described as the “back bone” of the NZ economy. In 2017 NZ was rated the 12th largest agricultural exporter by value accounting for 60% of the overall primary export value (J. de Boo, 2020).

The dairy industry is NZs largest export earner, experiencing growth of over 460% in the last 20 years. New Zealand produces 3% of the worlds dairy yet makes up 33% of the global dairy trade. With 95% of dairy produce exported equating to \$18.1 billion.

New Zealand has a high consumption of meat per capita, although plant-based protein consumption has risen, animal protein is the predominant choice with chicken surpassing beef as the leading source of protein.

Figure 2 sourced from ‘The Green Report’ (J. de Boo, 2020)

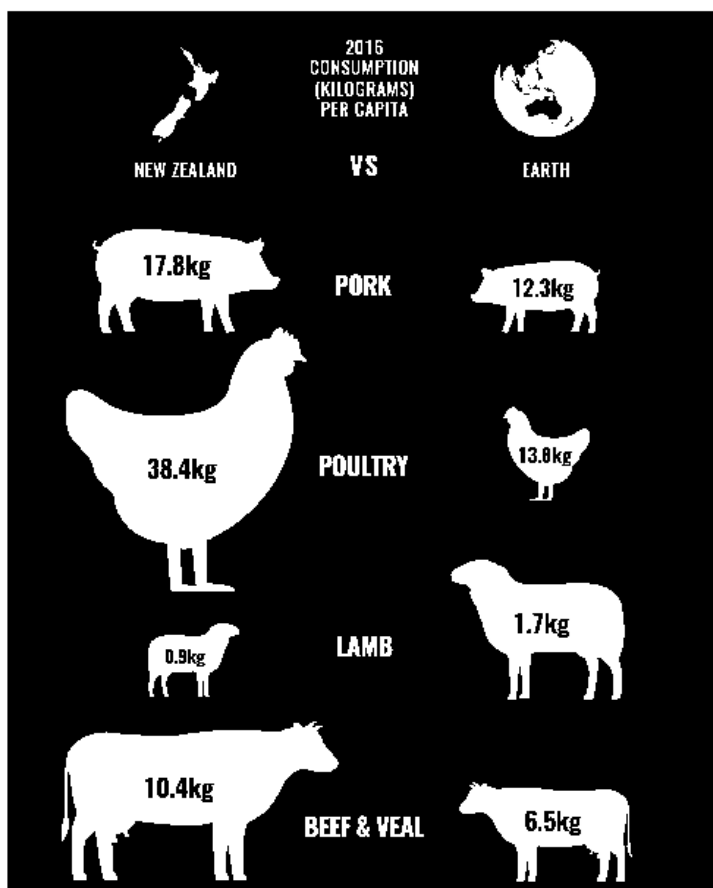


Table 2 Painting the Picture, statistics sourced from (Beef+Lamb New Zealand Economic Service, 2019)

### 170 million animals in NZ farmed for food (not including sea food)



3.8 million laying hens



125 million broiler chickens



800,000 deer



26.7 million sheep



10.3 million cattle



25,000 breeding sows

A predominantly pastoral based system of animal protein production shapes the environmental landscape of New Zealand as well as the economic landscape. Without agricultural exports, our high standard of living would be jeopardized. The challenge presented arises from 90% of the population residing in urban areas with limited contact or understanding of the food production system as well as the social and environmental aspect involved.

## **Plant Protein in the New Zealand Context**

While NZs current protein production model focuses on animal sources such as dairy and meat. The sustainability limits of the current system is being debated with forecasted population growth and subsequent impact on environmental resources. Internationally, Soy and Lupin are the highest plant protein producers however the NZ temperate climate is more suited to sources such as Lucerne, barley, beans, canola, hemp, kumara, linseed, white maize, oats, peas, potato, walnut and wheat (Sutton K, 2018). Scaling production of such crops will always be a challenge.

In NZ, protein from plant sources contributes to 40% of the average adult's daily protein intake. With the remainder made up of meat and dairy sources (Sutton K, 2018). In response to environmental concern, consumers are trending towards flexitarian diets, lowering meat consumption creating opportunity for plant or alternative protein markets.

A limitation for plant protein is, it is an incomplete source. A greater combination of food sourced proteins is required in order to deliver essential amino acids to complete a diet. Overseas incomplete proteins in certain crops such as soy varieties, has been overcome through genetic modification. A controversial topic in NZ, which has the potential to hinder progress yet also taint the entirety of the food and fibre sector from a consumer perception view.

NZ has approximately 1.7 million ha of land suitable for growing plant protein crops, 10 times more than the area currently classified for horticulture. Production and growth of crops is one aspect; however, the processing and extraction infrastructure are essential for a competitive successful industry. An opportunity identified for plant protein production is total plant utilisation. Eliminating waste streams and by-products increases overall efficiency yet requires more systems and value chains for the biomaterial.

Plant derived protein alternatives designed to imitate or replace animal protein products in the New Zealand market have faced challenges. Opposition comes from animal protein industry associations and the commerce commission surrounding the marketing and terminology potentially misleading consumers.

New Zealand agriculture has been centred around livestock production however the arable and horticulture sector have room to grow. When it comes to protein, there is a growing body of consumers who are looking to meet their dietary needs through plant-based sources. The popularity of plant-based diets is linked to health and wellness. However, greater awareness of processing required to extract, and support plant-based protein products could detract from the concept of plant-based foods being ‘natural and healthy’.

Several components required for success of the plant based protein industry in New Zealand are identified in the Opportunities for plant based foods report (Sutton K, 2018) as indicated in table 3. Key limitations identified are scale, infrastructure and access to market.

*Table 3 Components of plant-based food opportunities sourced from Opportunities in plant-based foods report (Sutton K, 2018)*

<b>Genetics – Plant cultivars and varieties suited to climate</b>
<b>Production – Technology Innovation to sustainably maximise protein yield</b>
<b>Manufacturing and Infrastructure – to support scale of plant protein extraction and manufacturing</b>
<b>Total Utilisation – Extracting and creating value from all aspects of the plant</b>
<b>Product Development – Creation of premium offerings</b>
<b>Research and Development- Creating a competitive channel to market</b>



## Alternative Protein

The definition of alternative protein from the future of meat report (Beef and Lamb, 2018) is, protein derived from plant, cultured meat and edible insects, providing substantial dietary protein while requiring less natural resource to produce. Alternative protein is composed of different sequence amino acids than conventional animal sources.

Production can be achieved using plant-based alternatives to create products that are indistinguishable from animal products by mixing known ingredients or extracting protein at molecular level and reconstructing. Another method is through culturing meat using stem cell technology or sourcing novel alternatives to create a protein rich ingredient.

Alternative protein isn't novel. Fermentation is an ancient food technology which is being explored as a response to climate change and animal welfare concerns. It can be used as a production tool to create a non-plant based dairy protein with minimal animal usage and a lower environmental footprint. The process occurs through harnessing microbes to produce protein. A benefit is that it can take place "anywhere that you can brew beer". The process is being used to create cheese in response to it being rated the 3<sup>rd</sup> worst food for greenhouse gas emissions. Through fermentation and taking the casein micelles only found in mammalian milk, it can create "cow cheese without the cow" (Matt Gibson, 2020).

The challenge surrounding alternative protein ranges from conflicting consumer ideals around genetic modification as well as fear derived from lack of scientific understanding. Consumer demand for a like for like product could potentially be neutralised over time as novel practices gain familiarity.

## Diet

**Diet and food choice have a huge influence in shaping the patterns of our lives. Understanding of diet corresponds directly to consumer relationship with food. Which is complex and psychological.**

### Terminology/understanding

"Vegan" is all the rage and is a diet descriptor many associate with plant-based eating. It is however a term which is loosely applied in many situations with the actual definition being: 'a strict vegetarian who consumes no food (such as meat, eggs, or dairy products) that comes from animals. Also, one who abstains from using animal products (such as leather).



The vegan society describe being vegan as “a way of living” which seeks to exclude, as far as possible and practicable, all forms of exploitation of and cruelty to animals for food, clothing or any other purpose. The vegan society of Aotearoa categorises three key reasons of why people decide to be vegan. These are animal ethics, environment and health.

A key theme across vegan related web pages is the offer to join as a member or donate to a cause. The significance is the concept of ‘being vegan’ extends beyond a simple diet choice. It has evolved into belonging to a community, to being actively involved in a purposeful cause.

With clarification of the meaning of veganism, it is likely that the term and label has been utilised freely in relation to plant-based eating and diets. There are other less widely circulated but more accurate labels as indicated in the table below.

*Table 4 Diet Terminology Sourced from, (List of Diets, 2020)*

Term	Consumes
Vegetarian	vegetables/ plant based with no meat.
Ovo Vegetarian	vegetable-based diet and includes eggs
Ovo Lacto Vegetarianism	vegetarian diet with eggs and dairy products
Lacto Vegetarianism	vegetarian diet with dairy products
Semi vegetarianism	vegetarian diet with occasional meat consumption
Kangatarian	vegetarianism with occasional consumption of kangaroo meat
Pescatarian	fish but no other meat
Pollotarian	No mammal, occasionally poultry
Pollo pescatarian	Fish and poultry
Climatarian	foods that reduce carbon footprint
Plant based	Mostly plant sourced food with varying rigidity

Labelling a diet comes with a strict set of rules which are often unsustainable unless followed with deep commitment. Restrictive eating guidelines can feed into a negative relationship with food.

Like anything, ease of use is important, and labels need to be user friendly. Terminology and definitions vary and the wide use of the term ‘plant based’ or ‘vegan’, suggests that there is discrepancy within terminology surrounding the rigidity of those diets. The label ‘flexitarian’ is growing in popularity as the concept is based on fuelling with what best serves health, energy and spirituality (values). It eliminates stringent rules while maintaining conscious eating practices and nourishment. ‘Flexitarian’ encompasses a high standard of eating practice with emphasis on wellness and balance of flexibility necessary to relax and enjoy social gatherings/ celebrations without limited food imposition.

## The Food Relationship

**“Setting yourself apart from others by what you will and will not eat is a social barrier”**

Our food and relationship with food is strongly interlinked with how we view ourselves. The food we consume is to provide nourishment and fuel. For some food can be used as a mechanism of control in life (Weaver, 2019).

The invisible belief system or prevailing ideology supporting human choice to consume animals is encompassed as ‘Carnism’. It is considered the opposite to veganism and classification of animal species is culturally dependent. The term was developed to identify that human consumption of meat is not questioned; it is considered normal. The rise of veganism and plant-based diets is challenging a belief for some which helps to explain defensive attitudes and behaviour of animal protein consumers towards plant-based eaters (Joy, 2009).

Consumption of animal protein is entrenched in many cultures and is part of traditions, festivities and lifestyles.

**For Example: Stepping away from red meat, Israel holds a Passover tradition which is a 7-day religious holiday where eggs feature predominantly and symbolically. The Country must import millions of eggs for that week alone because the country's domestic production of 9 million eggs per day cannot meet demand. Just one example of an animal protein which forms the basis of traditions, religions and routines (Beef and Lamb, 2018).**

In the developed world our relationship with food extends beyond a fuel to live. Food is at the bottom tier of Maslow's hierarchy of needs as one of the most essential basic physiological needs (McLeod, 2007). The theory states that in order to progress and focus on the upper levels of the pyramid, the foundation levels need to be satisfied.

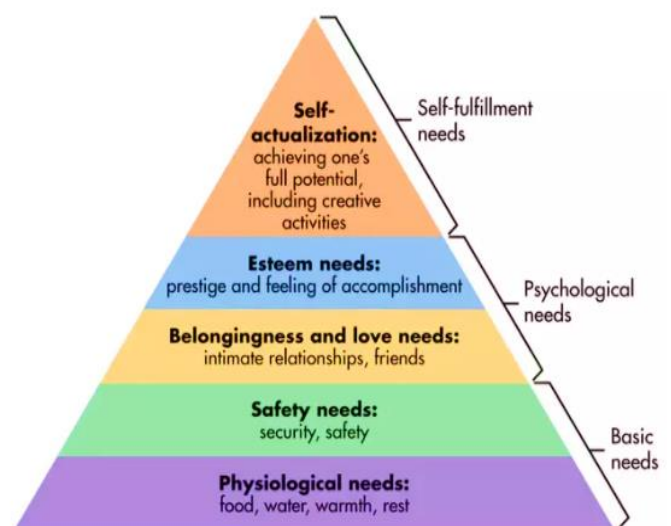


Figure 3 Maslow's Hierarchy of needs pyramid (McLeod, 2007)

With basic needs met, food can merge into the upper levels of the pyramid as human habits, social gatherings and psychological tendencies such as reward are shaped around food. Food is entrenched in our social system and cooking is a symbol of humanity. Human social behaviour revolves around the sharing of food with others. Humans are the only species that engage in cooking. It is a symbol of humanity. Hospitality and social generosity through exchanging of food is linked to our identity (Fox, 2003).

Historically the timing of meals was linked to social hierarchy as well as the location of serving. Every meal is a message and where we eat is as important as what we eat. The dining room is the most underutilised room in a house however it is considered a shrine to ambition for formal entertaining where impression is valued.

Similar to how we wear clothes, to indicate personal style, food when plentiful, becomes fashionable. Novelty and trend can be disguised as concern for nutrition under the masquerade of being 'healthy'. Food consumed can be used as an expression of self to project or portray a desired image to others.

"you are what you eat", Diet has a direct influence on brain activity and medical communities have started to acknowledge the connection between mood and food. For example, diets high in refined sugar have been found to impair brain function and worsen symptoms of mood disorders such as depression. The brain is fuelled from nutrients extracted from our food during the digestive process (Selhub, 2016).

**Serotonin is a neurotransmitter which helps to regulate sleep, appetite, general mood and inhibit pain. 95% of serotonin is produced in the gastrointestinal tract. The digestive system guides emotions as well as fuelling the body (Selhub, 2016).**

A diet that is rich in omega-3 Fatty acids has indicated to support cognitive processes in humans. Diets that are high in saturated fat are becoming notorious for reducing molecular substrates supporting cognitive processing, increasing cognitive dysfunction (Gomez-Pinilla, 2010).

It is evident that our food has a physiological and psychological influence from bodily function to social behaviour and expression. It is only when food supply is readily available and not under threat that the psychological needs relating to food consumption grows. Understanding the complexity of psychological needs and incorporation of food in social patterns would put food producers and marketers at an advantage to connect with consumers on a deeper level.

## Perception

Food is emotive and eating certain foods can trigger strong emotions of guilt. Guilt is a self-conscious emotion involving reflection in oneself. It is where someone feels conflict with themselves over past actions or thoughts which they perceive they should not have done or had.

One of the key factors contributing to people directing diet away from animal protein is that the concept of eating animals and subsequent environmental impact incurred, arouses feelings of guilt.

A British survey of 1000 people resulted in 40% acknowledging feeling guilty for eating meat directly. Frequent feelings of guilt is associated with mental health disorders suggesting that elements of food and eating decision-making feeds into a bigger picture such as the rise of mental illness (Chiroando, 2020).

The Meat paradox, consumer ambivalence towards eating meat influences employment of moral disengagement strategies. (Buttler, 2018) Feelings of guilt have been explored and fed into the meat paradox. It is a concept used to describe individual desire and pleasure of consuming animal products coupled with the morally troublesome aspect of the killing of animals.

A question that arises, is how closely we want people to be linked to the food source? If a true understanding of how animal protein is produced induces feelings of guilt and negative emotions, is it better for consumers to be disassociated with the process while having trust and assurance in brands?

## Factors Affecting Diet Change

There are three focus areas which affect diet change, concern for health, animal ethics and the environment. However, it is the communication of the relevance of these factors which holds weight and significance.



**HEALTH**



**ANIMAL ETHICS**



**ENVIRONMENT**

## Communication

Information channels influence diet choice and decision making, from ingrained cultural behaviour to value alignment and lifestyle orientation. The source of information from which people gather facts to base decisions around is varied however over the past 20 years there has been astronomical technological development and advancement. The internet and mobile technology have deeply penetrated human lives and as such has affected preferences and behaviours of consumers. The availability and accessibility of information has resulted in greater knowledge and contrastingly, misinformation.

The growth of social media has revamped how people interact, communicate and engage. Online platforms assist people in sharing personal information, news, photos and videos. It has created a level of connectedness never seen before. Out of this emerges the opportunity for influencer marketing.

In an old-fashioned sense, it can be related to word of mouth marketing. Influencers have ability to affect purchasing behaviour of consumers. They can influence trends and affect consumer thoughts, attitudes and opinions. The founding attributes are based on popularity and reputation however the social media platform has facilitated the evolution of influence from the ordinary consumer. A key message is that everyone has influence in their own network (Žák, 2020).

For example, an individual network is greater than we think. In New Zealand the average Facebook user has 338 'friends' and operates on at least 5 different social media platforms. At least 73% of the population have a Facebook account and 2.3 million people check Facebook every day.

The intensity and impact on consumers are varied dependant on product, however, food choices and diet labelling can be encompassed as lifestyle factors which are key influencer focuses.

Media also has its place. High-profile films and documentaries challenging perception about food, climate, social behavioural and societal norms. Film techniques shock people into reconsidering their choices. The 2020 released documentary 'The Social Dilemma' details that social media platforms aim to create a psychological profile of its users to gradually manipulate behaviour and perception change through imperceptible visualisation of content. Algorithms are designed to expose users to content they are most likely to believe or align with. Thus, facilitating an environment for fake news to impression upon people and erode the concept of truth (Orlowski, 2020).

## The Health Factor

What we eat greatly impacts our personal health. Social developments over the past century have led to significant improvements and increases in living standards of industrialized countries. Such development has coincided with drastic lifestyle alteration and a shift from plant based eating patterns to animal based foods due to greater availability and accessibility (Drew, Cleghorn, Macmillan, & Mizdrak, 2020). This shift has been connected to a dramatic increase in the rates of noncommunicable diseases, including cardiovascular disease, cancer and diabetes. Collectively, these diseases account for 73% of deaths globally. Sub optimal diets and exposure to unhealthy food environments are considered the single most important risk factor for mortality both globally and in New Zealand (Drew, Cleghorn, Macmillan, & Mizdrak, 2020).

The medical community have correlated non communicable diseases with red meat consumption. A diet consisting of minimal red meat and dairy products and made up of predominantly fruits and vegetables have a 31% lowered risk of heart disease and a 21% lowered risk of stroke (Harvard School of Public Health, 2020).

Obtaining accurate information regarding the health impact of red meat and other animal protein consumption is difficult as food is usually paired. A diet alone is not an accurate reflection of an individual's health status. Smoking cigarettes, consumption of alcohol and approach to exercise are all contributing factors to non-communicable diseases. A diet consisting of high processed red meat and dairy products is usually combined with a lack of fruit vegetables and sub optimal living habits all feeding into the general health picture. The consumption of red meat alone cannot be fully culpable for development of disease.

However, esteemed perception and trust in the medical community has impacted red meat as a reputable protein source. Red meat is available in many forms and the nutrient bioavailability can be influenced through the animal rearing process. The inputs in an agricultural system can have a flow on affect to the health of the end consumer. A high consumption of processed red meat has been linked to obesity. The varying forms in which meat can be consumed means that all meat is not equal in nutritional quality.

## Animal Ethics

"There is no humane or ethical way to eat animals, the most important thing you can do is to stop eating meat, eggs, and dairy" (PETA, 2020). Compassion for animals is one of the main reasons people become vegetarian or vegan (NZ Vegetarian Society, 2020).

Anthropomorphism which is the attribution of human traits, emotions or intentions towards animals is a factor which induces feelings of guilt towards meat consumption. Those who can disassociate from a food story are more inclined to be comfortable with eating animals (Wang, 2019).



Vegetarianism was recorded as early as the 6th century in ancient Greek and Indian civilizations (Wikipedia, 2020). The diet was closely connected with the idea of non-violence towards animals and entwined with religious beliefs. The knowledge that animals have feelings like humans can be an uncomfortable thought especially when people form emotional attachment to creatures. It also comes down to a belief factor with people thinking that all creatures have a right to life and freedom (The Vegan Society, 2020).

## Environmental Concern

The health of the environment we live in is a factor connecting all of humanity. Climate change is considered the defining issue of our time (United Nations, 2020). Modern civilization growth in industrial activities has raised atmospheric carbon dioxide levels from 280 parts per million to 414 parts per million in the last 150 years (NASA, 2020). The change in the natural atmospheric conditions results in a stronger greenhouse effect contributing to global warming and resultant extremes in weather events experienced globally. With forecasts of the world's population to exceed 9 billion over the next 30 years, the demand for protein is rising which will put inevitable pressure on our existing food production systems.

For example, meat and dairy production utilises 83% of the world's farmable land and produces 60% of the agricultural greenhouse gas emissions. Ruminant animals farmed for red meat production and milk emit methane gas as part of their digestive process. In New Zealand, the release of methane gas from ruminant livestock equates to 1/3 of the greenhouse gas emissions. In a global sense, methane also accounts for over 40% of all emissions in terms of global warming potential. While livestock are not the dominant cause of methane emissions the correlation between global warming and animal protein production is identified. As technology improves assisting social and political stability, the middle-class bracket is expected to swell also driving an increased demand for protein.

**A question posed to global leaders is how to feed the bulging population while maintaining harmony with the natural environment?**

Animal products require more water usage than fruit, vegetables, grain and legumes. Agriculture utilises 70% of the planet's freshwater consumption (J. de Boo, 2020). Contamination of surface and groundwater can occur as a result of intensive farming practices. Detrimental environmental impacts as a result of agricultural production will have a resounding negative impact on the standard of living, we are used to.

The relationship between agricultural practices and negative environmental impacts is a topic hard to avoid in our globally connected era. For consumers disconnected from the production of food, it is hard to distinguish variance in agricultural practices specific to country. A discerning approach is required when considering studies where the research suggests that red meat or high consumption of animal protein products is a leading cause of non-communicable diseases and obesity. A limitation or observation is typically raised surrounding undesirable lifestyle habits which could equally be a cause of health degradation. Anything in excess has the potential to affect health.

## **Global Trends**

By 2050 the world population is expected to increase by 2.5 billion people to 9.7 billion with over two thirds residing in urban areas (Plant and Food Research, 2018). The pressure on the planets resources and global food supply system will increase as the demand for food rises with population growth.

Protein consumption historically has been driven and determined by wealth (Plant and Food Research, 2018). An emerging middleclass defined as a “cohort who have sufficient regular income to cover basic living needs, with enough money left for a few luxuries” are driving an increased demand for protein worldwide (Ministry for Primary Industries, Global Middle Class 2030, 2019). Improved consumer awareness of the role protein plays in our diet and bodies, has driven popularity of consumption as well as innovation in packaging – the development of alternative protein.

China and India are predicted to have the greatest number of people emerging into the middle-class bracket, there is potential for this group to adopt a western diet, maintain traditional eating habits with additional protein or to establish their own style and preference. Irrespective of what trends, the demand for protein is rising (Beef and Lamb, 2018).

Modern living has altered the prioritisation value of food. Price, convenience, variety and taste, feed into the overall eating experience which deviates from a traditional consumer value model. Greater transparency of the food chain and awareness of the impact of food production systems influence consumer food preference towards sustainability.

In developed countries a rising concern is climate change. It is the biggest global issue of our time and our food production systems are an important component. Consumers are becoming more conscious of the impact their food is having on the environment. A decline in print media and rise in social media platforms have affected the way people learn about the world around them. Social media platforms enable every user to have a voice and an opinion. The role of influencers is prevalent and the use of algorithms on these platforms means that people are exposed to similar themes and trends constantly.

David Attenborough's witness statement in the 2020 released documentary 'A life on Planet Earth' emphasises that our demand for animal protein is destroying the natural world. He openly advocates for plant-based diets to be adopted in order to preserve the environment. His angle is approached with the environment in mind rather than a health argument. Of the multiple messages Attenborough was trying to convey, the avoidance or reduced consumption of animal protein is the one most heard.

People are inclined to believe what they see the further removed they are from the food supply and value chain. In Britain over the past three years the number of people following a plant-based diet has risen 340% from 160,000 in 2014 to 600,000 in 2019 with 20% in the 16-24 year old age bracket (The Vegan Society, 2020). Linking back to relationships with food, people can use their diet as a mechanism to feel in control when presented with issues such as climate change outside of their control.

## **New Zealand Trends**

"if it's happening overseas, it's happening here" – Vangali Vitalis. New Zealand is not immune from trends occurring globally. Although geographically isolated we have strong social links to the western world and our culture is linked with Europe and north America.











Technology, high speed internet has eliminated geographical barriers, connecting New Zealanders with the rest of the world. The NZ vegan society expects a quarter of kiwis to have omitted meat from their diet as soon as 2025. According to the 2019 Colmar Brunton Report, 15 % of New Zealanders are vegetarian, an increase from 10% in 2018 and 7% in 2017.

Celebrity chef and founder of My Food Bag, Nadia Lim indicated that over the past 18 months there has been noticeable change in consumer interaction with her food delivery and meal planning business. She believes that people are craving simplicity due to confusing messages surrounding food and are therefore attracted to wholefoods. She reemphasised that concern for health, environment and animal ethics underpin modern thinking around food (Rasmussen, 2020).

Of the Kiwis surveyed in the Colmar Brunton report, 49% recognised that their diet has an impact on the environment. The vegetarian and vegan resource web pages are promoting the viewing of Netflix documentaries such as Cowspiracy despite research and issues being based around overseas farming practices and systems. The extrapolation of environmental issues caused by global farming practices fails to differentiate New Zealand farming systems.

The availability, selection and choice of plant-based protein substitutes has flooded the market. The table below indicates a few of the novel NZ companies which are feeding the niche yet growing proportion of people exploring protein alternatives.

Table 5 New Zealand Plant based or alternative protein products and businesses

New Zealand Plant based or alternative protein products and businesses		
	Otago Locusts	New Zealand's first food grade insect farm, producing grass fed locusts.
	The Green Brothers	Hemp Food Company
	Plant Culture	Hemp seed-based products
	Angel Food	Dairy free Cheese products
	Savour My Goodness	Plant based Cheeses
	Otis Milk	Oat Milk
	Alternative Dairy Co	Dairy free milks and cheese.
	Olive and Ash - Vince	Plant based mince convenience food
	Sunfed Meat	Plant based meat
	The Craft Meat Co.	Plant based meat

## Generational Variation

Table 6 Generation Descriptions

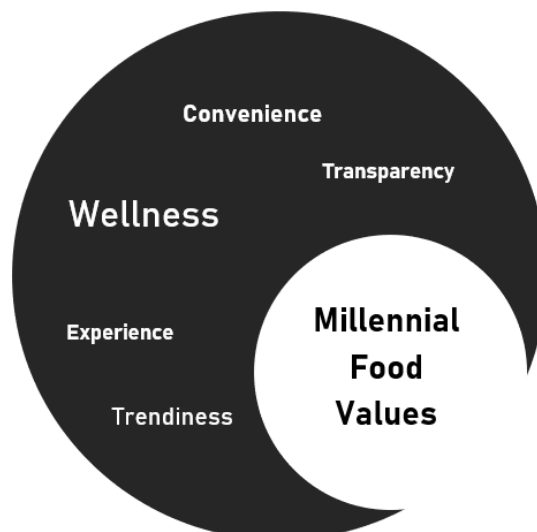
The Generations	
<b>Traditionalists</b>	<b>Born before 1946, (also referred to as the Silent Generation)</b>
<b>Baby Boomers</b>	<b>Born between 1946 and 1964</b>
<b>Gen X'ers</b>	<b>Born between 1965 and 1980</b>
<b>Millennials</b>	<b>Born between 1981 and 1996</b>

A millennial is a person who reached young adulthood in the early 21<sup>st</sup> Century, born between 1981-1996. The millennial generation have food preferences which differ from older generations. They want to purchase brands and consume food that align with their dietary nutrition goals and values such as sustainability and philanthropy. They are of the belief that as a generation they are more concerned about food and health with a proportion of 58% considering themselves as 'foodies'. Over 60% believe their generation is more health conscious than other generations (Yue, 2019). Health is a concern however indulgence is valued along with portion control as food is considered a social factor bringing joy. It also plays a role in personal representation and expression. Many companies are seeing benefits from rebranding to cater for millennial values, downsizing product offerings and marketing the health benefits of the food.

Millennials are considered the 'busy' generation thus the need for eat 'on the go' convenience foods. As a generation they exhibit higher preference for convenience with less expenditure on 'food at home' requiring preparation and more on pre prepared foods. Compared to Generation X, millennials spend 55 mins less on food prep per day and overall 12mins less time eating than traditionalists (Kuhns, 2017).

Millennials make up 20% of the world's population and nearly ¾ of the global workforce. They have huge power to shift and reshape the food industry based around their values and lifestyle. Millennial buying power increasing in prominence will shape the consumer landscape and food marketers and producers will need to respond to cater to Millennial food values.

Figure 4 Millennial Food Values



# PARTICIPATORY ACTION RESEARCH

## 21 Day Vegan Trial



### Challenging the Bias

I realised that working as a rural professional and having values closely aligned with the rural community, I have a strong bias towards including if not basing my diet around animal protein products. I noticed that when I was researching vegan living and the rise in plant-based diets, my bias was towards animal protein consumption. The true moment came, when I was manning a BBQ for a group of farmers and when the meat was laid out ready for the pickings, I caught myself before I uttered “I hope no one is Vegan”. The comment itself isn’t aggressive or offensive however I realised it was coming from a derogatory place. I questioned, in a society where we are accepting of so many things, why is someone’s food choice an issue. In order to improve my understanding and to challenge my thinking and bias I undertook a strict (ish) 21-day vegan trial.

Initially I was hesitant to share with others what I was doing for fear of judgement. The majority of my social circle and professional interactions are with people who are directly involved or have a connection to farming and producing animal protein. My perception was that people aligned with this industry would be judgemental and find it personally offensive considering my choice ‘not supporting’ their industry.

### Physical Observations

From a personal health perspective, I noticed that I felt generally better about my eating. This I believe is down to the unintended consequences of following a strict dietary guideline. For example, typically snacks such as baking, muesli bars, biscuits or crackers which are high in sugar, gluten, carbohydrate and containing dairy were omitted from diet. My normal approach to eating is smaller meals with intermittent snacks to keep me fuelled on the go (Typical Millennial). I operate at high octane levels, exercising sometimes twice a day, work long hours with a significant amount of time travelling. When cooking for myself, I put in very little effort. Appreciating fast meals (never fast food) served within 20 minutes. Very little planning went into my diet.



## Change in Habit

Going Vegan meant I had to address these somewhat unhealthy habits. I ate healthy food at mealtimes but overall, I recognised that I had an unhealthy approach to food and eating. Going vegan flipped that routine on its head. I was more organised and considered in my approach, I ate more at mealtimes and had fewer snacks because of limited availability. Lowered sugar intake made me feel focused and happier because I wasn't experiencing blood sugar level surges. I also felt that my relationship with food improved.



## Positive Observations

I have never been overweight however food and body image are contentious which I presume most young females can identify with. Consuming a solely plant-based diet, I had the perception that what I was putting into my body was "healthy". The mental pay off for this was that I was kinder to myself. Previously, there was a subconscious element of guilt when eating food that I knew wasn't good for me. Especially if it was not in moderation (a whole block of chocolate... we have all been there). The perception that I was filling my body with healthy vegetables, beans, grains (wholefoods) every meal had a positive impact on the way I perceived myself.

Another positive consequence was that I was consuming more and feeling better about it, I lost weight because I was having less dairy and sugar. My energy levels were sustained, and I wasn't so distracted by hunger. I felt as if I was fuelling with what my body needed. Once I started thinking about vegan food and cutting out any animal protein consumption (including honey), I started to notice the availability and accessibility of options which I had previously been oblivious to. I was hyper aware of vegan food outlets and eateries in my immediate vicinity. I started researching places to eat, meet and socialise with people at, to ensure I could maintain my commitment to the trial. I followed social media pages with recipe ideas to keep me motivated.

## Negative Impacts

On the flip side there were some negative observations. For one I found myself to be craving meat however when presented with eating foods that contained animal protein, I felt obsessed with the need to be healthy. My perception was an association between being vegan and being healthy. The rigidity surrounding a vegan diet caused me to perceive deviation as being unhealthy. I noticed the start of minor paranoia/concern when I didn't have options available especially in social situations and I recognised that it was a source of stress. I was afraid of judgement and must confess I was selective with who I shared my progress with. I felt embarrassed asking for vegan options or even plant-based milk in my coffee plus it was more expensive.

There was an element of confusion around the environmental benefit this new eating regime was delivering. Supposedly my efforts were environmentally friendly however I was hyper aware of the barrage of information regarding the emissions, water usage and carbon footprint of my food. The fact that it takes 5 Litres of water to produce one almond weighed on my mind. However, I felt drawn into negative messages concerning overseas farming practices despite my knowledge and involvement in NZ agricultural systems. I could identify with extrapolating global issues and repositioning the messages to apply in a NZ context.

## The Invisible Load



I accepted that there was an additional element of stress associated with having a strict diet. I recognised that I was experiencing stress due to the desire to stay true to the trial yet conflicted in social situations and lack of flexibility. Having a strict diet to follow feeds into the 'invisible load' that people are carrying. It is a state of mind which has a physiological effect, created by ourselves and based on what we perceive people think of us. I personally am not a huge social media documenter, yet I am not immune from wanting others to think I am healthy and happy.

## Fixation with Fat

I realised that by conducting the trial, my attitude towards animal protein changed. I became fixated on fat. One evening I visited some friends on their farm and home kill roast lamb was served for dinner. The contradictory thoughts swirling in my head centred around my awareness that this was top quality meat, grass fed, reared humanely, killed humanely and processed organically. I have a sound understanding of nutritional science I know and believe that animal fats are a good source of energy. Eating fat in moderation doesn't translate into body weight gain. Yet with all that knowledge, in this instance, all I could focus on was the newfound repulse I felt towards eating fat marbled meat.

I was acutely more aware and considered about how animals were raised. The meat section of the supermarket seemed like a bad place, so did the dairy section. Before I had always been intrigued and drawn to the packaging especially around yoghurt and cheese, I felt a strong desire to avoid these areas. The fixation on fat was something I hadn't expected and having never been brought up to waste food, I found myself picking around the edge of a plate, increasing food wastage and discarding hot drinks made with cows' milk.

On the several social occasions where I deviated from the trial, I took note of the disappointment tainted with shame I felt at not sticking to my original goal.

Towards the end of the trial I started considering my approach to phasing animal protein back into my diet. 21 days is a short time period and I was surprised at how quickly my opinions towards animal products changed. The idea of launching straight back into consuming milk and meat made me feel sick. Having previously been a cheese lover, the idea of having a large 1kg block of value cheese taking up real estate in my fridge was not appealing. Interestingly the meat I felt positive towards was lean meat such as venison. Towards grass fed, non-fatty meat. I seemed to have developed a real issue with fat.

## Key Observations

A key observation from this trial is that with an increase in focus, despite connection and knowledge about the food production systems in New Zealand. It is very easy to succumb to manipulation from the negative messaging surrounding animal protein. Our approach to food has a significant mental and emotional impact as well as a physical one and our attitude and behaviour towards certain food groups can change incredibly fast.



# FINDINGS

Through conducting this research several themes were deduced underpinning the reasons why people consider altering their diet to be described as plant based. These were animal ethics, personal health and concern for the environment. Other interlinking topics arose during exploration which I thought worthwhile deducing. These were a gender perception disparity towards food messaging and the effect of food decision making on emotions and self-discernment.

## Land and Climate Combination

Land was consistently a theme which was raised during the informal interview research component. In New Zealand, not all land class and climate combinations are suited to growing food for human consumption. By farming animals, we are converting a plant (grass) which is unable to be harvested or digestively utilised by humans as an energy source. The perception and reality that animal agriculture is bad for the landscape is real however critical thinking is required to identify that it is not a blanket rhetoric. The beauty of farming animals is that they are utilising land that doesn't grow edible crops.

What people tend to overlook about outdoor farming is that plants grown outside harness sunlight automatically which is energy efficient. As soon as that process is replicated indoors, the energy cost is high and carbon footprint grows. In dense urban environments, people have a desire to be connected to land and nature. Vertical farming is a solution bringing the production process physically closer to the consumer however it is a highly controlled environment with large energy demands.

There is huge concern around the environment relating to animal protein production however the spotlight has not been shone on horticulture. Growing vegetables is intensive and very industrialised, requires high fertiliser and chemical inputs and is tough on the soil.

NZ is unique when it comes to farming for animal protein. Rotational grazing is considered common sense and a normal approach in pastoral based agricultural systems however in comparison with United States counter parts, it would be classified as 'regenerative' and best practice'. NZ soil health is high, our 'mundane' is profound. In response to environmental concerns, people are feeling that by removing meat from their diet it is a contribution to the cause. A controllable factor they can make a conscious decision about (Marsh, 2020).

## **Lifestyle Factors & Perception**

“In NZ we under eat protein” The national dietary guidelines haven’t been reviewed for a significant time (2009) and the average intake of protein was 16% of recommended dietary intake per day. The major sources of dietary protein were from carbohydrate dense foods such as bread and bread products (Williden, 2020). People are lacking fruit and vegetables in their diets and a change in lifestyle is equating to altered eating patterns. People are living ‘crazy’ busy lives. Eating has changed and evolved to happen on the go. Meals are few and far between with snacking all day long which can explain in part the obesity crisis. People are shying away from traditional meals as they are not cooking at home anymore. Cooking is a rarity and consumption of steak on a plate at home is replaced by steak in a salad. People tend to heat a healthy diet for 5-6 days in a week however they can tire of restrictive eating or a bombardment of healthy messages. They will potentially be more relaxed with their approach to eating in a weekend or at a social event.

Plant based diets and eating is becoming popular and is taking people back to consuming whole foods. The positive perception towards plant-based eating is favourable for innovative products introduced to the market however ignorance of processing and manufacture obscures the deviation away from whole foods.

## **Challenge of Marketing**

Marketing in NZ is currently poor from animal protein producers and their associated industry bodies. Which in conjunction with the narrative around red meat being ‘bad for you’ is particularly damaging to the industry. Consumers have a desire to know about what they are eating and what is on their plates. They want to know that the animals have had a good life and been treated humanely as well as the processing and packaging is sustainable and environmentally friendly. “They don’t want to know about the part in the middle” (Taggart, 2020). The idea of animals being slaughtered incites feelings of guilt which creates a negative association with food.

Articulating a story with subtle education to overcome consumer concern around animal husbandry is a powerful marketing tool. Targeting the correct consumer is expensive for small markets and requires resource. The beef and lamb taste pure nature campaign has been very targeted yet has seen positive results.

The best marketing and advertising of New Zealand products is through our tourism industry. Of all the targeted campaigns launched by industry bodies, the number doesn’t match the number of countries that we sell our produce to. People have come to NZ, seen the country, experienced the landscape, the clean water, the unpopulated countryside and have forged their own connection with our favourable products. While there is room to improve, “Compared to other countries we are lightyears ahead with our regard for and management of the environment” (Taggart, 2020).

The impact of the COVID-19 pandemic is ever evolving however closed borders presents a barrier to markets that we have never experienced before. Nationwide lock downs have altered peoples eating habits and patterns. People have had more time at home to cook and consume food as opposed to eating around commuting to places of work. Protectionism and promotion to support local may have a negative impact on NZ exported produce. In contrast, the pandemic has directly threatened consumer health and government response has enabled people the time to explore, research and evaluate their eating habits with an emphasis on wellness. (Ministry for Primary Industries, 2020)

Plant based eating is still a minority diet choice worldwide and while numbers have seen to be increasing, the loud media attention in this space is not positively correlated with the uptake. Every trend has a counter trend. Alternative proteins are novel, they are a new competitor, they are not a threat to animal protein, they are a choice (Marsh, 2020). Humanising animals is a very western view, there are some animals/ insects that aren't perceived to feel pain and thus there is no concern or guilt factor about eating them e.g. insect protein alternative.

## Gender Disparity and the Target Audience

The relationship between gender and meat consumption has evolved over time. In our current food environment, messages directed through advertising creates pressure around conforming to a body image. It is perceived that eating meat will make you fat or bulky. Meat marketing is considered masculine with an example of a McDonalds advert in 2012 correlating, '100%Manly Man' with 100% pure beef.



*Figure 5 Example of masculine advertising, Jack Links Beef Jerky - Feed your wild side*

There is limited research on the sex differences in the relationship with meat however men are more inclined to link 'health' with meat than women. In pre agricultural hunter gatherer societies, men generally hunted large game and women tended to cook it with supplemented gathered food. There is an idea that meat is linked with masculinity or the concept of precarious masculinity, a societal pressure to exhibit machismo (Gorvett, 2020). This can be translated to the animal kingdom where larger more physically robust males typically dominate other males to gain status. Meat could also be more appealing to men because it reinforces the sense of social dominance and hunting is seen as high risk (Love, 2018). In the 19<sup>th</sup> century with progressive women's rights, it became socially acceptable for women to dine in public without men. Food that was deemed suitably feminine didn't incorporate meat and was limited to dainty salads and exquisite desserts.

The number of recorded vegetarians, vegans or people following plant-based diets around the world has a higher ratio of women to men. In a US survey of 11,000 vegan people, 24 % were men. Women on the whole are considered to be more compassionate than men which is potentially a factor explaining why women make up 75% of animal rights group members (Gorvett, 2020).

When confronted with the meat paradox, women use avoidance strategies to cope, trying to disconnect meat with animals, they tend to modify behaviour in response to health or animal welfare messaging while men respond with confrontation and indignance. Women are less likely to eat too much meat and more likely to pick up on health messages not to eat meat. They form the majority of the “worried well” who are also more likely to take action surrounding the climate change concerns. The Colmar Brunton report indicated that 61% of women were concerned about climate change as opposed to 48% of men. The colour of meat can be unattractive to women, studies have been done that women are less likely to want to consume meat that is too pink or bloody. It is a good source of iron and readily available for human digestibility which is a message that needs to speak to the female audience.

It is apparent that men and women think differently and messages around meat marketing resonate in different ways. A tailored marketing approach will be more effective considering reactive emotions initiated by meat or other animal protein consumption.

# CONCLUSION

The world is changing. Population growth, technological advancement and increased connectivity is reshaping values and lifestyles subsequently relating to how and what people consume. Food is integral to human survival, yet it is tightly incorporated into the fabric of our society and for many ingrained as a subconscious belief which shapes our thought processes. Food consumption in the western world is no longer about survival. It encompasses lifestyle, image, indulgence and is used as a mechanism of control to overcome feelings of insignificance in response to overwhelming global issues.

Consumers are becoming acutely aware of where their food comes from and there is an element of cognitive dissonance in approach to consuming animal protein. Three interlinking factors form the foundation for diet behavioural change towards plant based or alternative protein. These are animal ethics, health and environmental concerns. There are many exclusionary diets which people follow for various reasons however the three listed previously are the underpinning factors and most prevalent. Restrictive eating and confronting messages create experiential negative tension affecting personal relationships with food and self-perception. Attraction towards vegan groups is evident from rising membership, the appeal is founded in the aspect of delivering an element of control to an individual who feels insignificance towards global issues. Global connectivity and expanding personal networks create a sense of culture and belonging where people feel purposeful.

In New Zealand, despite geographical isolation, we are not immune to trends occurring offshore. Our strong cultural links to the United States and the United Kingdom, shared language and media, see people emulating concern for animal husbandry and environmental concern around agricultural practices not relevant to New Zealand Farming systems.

A contrast in gender response to negative animal protein messages or targeted marketing is apparent through disproportionate male to female identified vegetarians or vegans. Comprehension and action in response to food and health messaging differs dependent on gender and generation. Food values are shaped by lifestyle factors which vary across generation however the three fundamental dynamics of animal ethics, health and environmental concern are pertinent.

Alternative and plant protein products are gaining traction in the domestic market with some animal-based protein manufacturers looking to diversify product range. Disputes surrounding terminology and marketing of imitation products have resounded, however the industry assessment is that alternative protein products have a place and are a choice not a threat. Novelty factor overrides awareness of the energy intensive and processed manufacturing of food in this product range.



The Impact of the COVID-19 pandemic is evolving however it has altered social patterns and thus approach to food consumption. The link between food and health has been reinforced and highlighted as personal health has been threatened by the virus. Connection to the food production system has strengthened as people have had to re-establish cooking from home and have had time to research products.

The rise in plant-based diets and volume of communication in this space is expected to continue. Agriculture will remain under the spotlight while climate change is a prevalent issue and the availability, selection and choice of plant-based protein substitutes will flourish. The challenge to animal protein marketers will be to speak to the three core factors which all people can relate to. They will need to identify that there is gender disparity in reception of messages and have sensitivity towards the consequential and complex emotions associated with animal protein consumption.

# RECOMMENDATIONS

The research has explored reasons behind a movement towards plant-based eating and elimination of animal protein from diet. In the NZ environment the animal protein industry would benefit from further investigation with the following considerations.

## The Feeling of Food

All food producers and marketers to ask the question: *How does what and how we are eat make us feel?* The psychological affect and relationship people have with food has a huge bearing on health and wellbeing. Production and marketing need to focus on eliminating concerns or stress points regarding food production. For example, taking into consideration the three pillars initiating diet change, animal ethics, environmental concern and health with the aim of encouraging positive eating experiences.

## Overhaul Dietary Guidelines

Existing diet guidelines are centred around physical health however an extension to address stress associated with diet labels/terminology and restrictive eating would be beneficial to consumers. Eliminating mixed messages from the health sector and food producers and marketers would also be advantageous. New Zealand consumers are not discerning of global food production issues and our industry would be naive in thinking that New Zealanders have different concerns to international counterparts. The COVID-19 pandemic has encouraged people to place a higher value on food production and emphasised the link between food and agriculture for some. In contrast, health, one of the underlying factors to influence diet change was threatened by the virus hence more weight is given to negative messages surrounding consumption of animal protein products.

## Focus on the Three Pillars

Industry, marketers and food producers need to acknowledge, understand and address the factors behind a shift to plant based diets. Once people start becoming consumed by messaging, it is hard to reach them with counter messages. It is vital to reach people before they commence on a strict journey towards a plant-based diet as its not only a diet but a lifestyle. People are moving away from a subconscious belief system and how their food influences emotions is more powerful than knowledge they might have around production. An option could be to partner with plant-based producers or have plant-based product offerings to extend branding and increase consumer choice.

## **Who are we speaking to? And Who is Listening?**

Marketers and Industry need to consider masculinity and meat. The gender relationship with meat has been entrenched in social patterns and there is disparity between genders. Women think, learn, act and react differently to men. Women are more likely to listen and act as a result of messaging focused on food production and health. They are more likely to initiate behaviour change on compassionate grounds.

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