

Future of Meat

How should New Zealand's red meat sector respond to alternative protein advancements?

SUMMARY REPORT

February 2018



BY FARMERS.
FOR FARMERS







Project Overview

Objectives

The overall objective is to understand how New Zealand's red meat industry should respond to potential future disruption relating to alternative food sources such as plant-based proteins and cellular, lab grown meat.

Specifically, we're wanting to:

1. Better understand the shifts in food and food production technology that's occurring today
2. Identify threats and opportunities for New Zealand's red meat sector (scenario planning)
3. Identify the types of shifts and activities required to address these threats and opportunities

Definition of alternative protein

"Alternative proteins, such as plant-based protein, cultured meats and edible insects, provide a substantial amount of protein but require less natural resources to produce than the most common protein sources, meat and fish. These are composed of different sequences of amino acids than conventional meat."

Approach

Beef + Lamb New Zealand engaged Antedote, a San Francisco-based innovation consultancy to explore the potential of future disruption to red meat related to alternative protein sources.

Antedote conducted an in-depth analysis of the market interviewing a range of experts across the value chain for red meat and alternative proteins. Cultural experts, sociologists, influencers, chefs, nutritionists and regulatory bodies were interviewed. Secondary desk research and analysis was also conducted globally with a focus on Europe, Asia and The America's. Primary consumer research was also undertaken in the US and China.

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Key findings

The world population is expected to grow by a further billion by 2030 to 8.5 billion, and up to 9.7 billion by 2050.

Governments, non-government agencies, and investors are looking at how to feed these people and alternative proteins will have a place in this market, as will red meat.

Consideration, and acceptance of alternative protein products are a response to concerns for health, the perceived negative environmental impact of producing red meat, animal welfare and the change in eating patterns by consumers. Consumers are choosing to make what they feel is an ideological decision to eat alternative protein. In part, this can be linked to the backlash against broken food systems e.g. factory farming and “big” food.

The same considerations that are leading consumers to consider alternative proteins are the ones that give us confidence that there is a strong opportunity for New Zealand red meat. There is a desire for better food at all levels which supports a strong future for “real” red meat.

This is reflected in the USA market place where retail sales of labelled fresh grass-fed beef reached US\$272 million in 2016, up from US\$17 million in 2012. Sales are doubling every year.

The report finds that although alternative proteins are currently produced in small volumes due to limited manufacturing capabilities they should reach large scale production of burger patties and mince within five years. This will create competition with New Zealand’s beef exports, particularly to the United States. Currently, the US takes 50 percent of our beef exports and a large proportion of this goes into burger manufacturing.

Beef muscle cuts are a lot further behind and sheepmeat is not yet being looked at.

Whilst alternative proteins are not a new development, recent advances in food technology along with the aforementioned drivers have created new products which are gaining consumer acceptance.

There are seven forces which are supporting the alternative protein movement, these include:

1. Global meat consumption is on the agenda of governments as they grapple with managing the environment, population growth and the health of their citizens. Whilst change will be slow, we are expecting regulatory measures by governments which may effect red meat consumption or production.



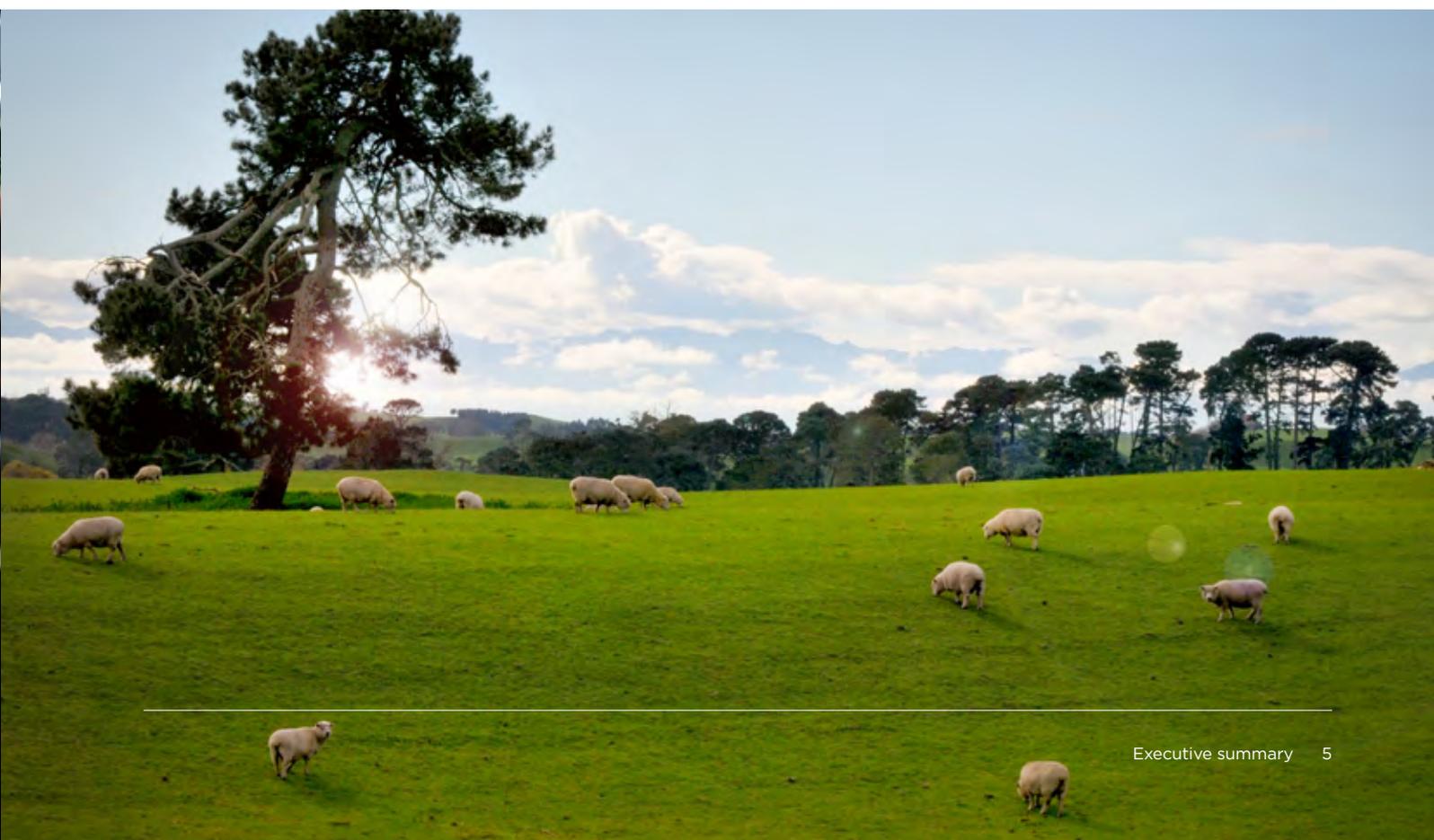
2. Data from the international medical community is also starting to highlight the health risks of red meat, while promoting the benefits of plant based protein. The healthcare industry is promoting less red meat through their nutritional guidelines.
3. Athletes and other mainstream influencers are starting to push the performance benefits of plant protein diets, with the conversation moving from being focused around niche animal ethnics to a mainstream dialogue about sustainability and health benefits.
4. Many of the investors in alternative protein products are wealthy and experienced in creating and marketing consumer brands. We are not competing in the primary producers sector; we are competing against highly sophisticated, consumer packaged goods companies that are raising the game for the historically niche vegan/vegetarian category.
5. Millennials eating patterns are starting to reshape the food industry. Their social values, holistic wellness goals, prioritisation of experience over product, new eating patterns and their sheer size are driving change.
6. The technology to produce a consumer ready alternative protein burger is here and is pushing for commercial scale. There are multiple competitors, with more likely to enter the market, pushing the race to achieve mass production and distribution.
7. There has been a dramatic increase in the mainstream availability of alternative protein products, in the grocery aisle, at quick service restaurants and via niche business models.

The report puts forward four potential scenarios to challenge our thinking and spark discussion within the New Zealand sheep and beef sector about how it may seek to strategically respond to the seven forces.

It is a wake-up call to ensure we understand what is important to premium consumers, that we protect our natural food production systems and products, and do more to ensure that our customers and consumers recognise that New Zealand's red meat farmers are in the natural foods business.

This report reinforces the importance of the work that B+LNZ and the sector is currently doing to develop and activate the global origin brand and red meat story, developing the National Farm Assurance Programme and underpinning this with strong environmental performance. New Zealand has a unique story to tell in terms of our extensive, grass-fed, hormone free production, which we just need to tell better.

Through learning about the threats to the red meat sector, B+LNZ is better prepared to assist the red meat sector plan for the future. We will be discussing the report's findings with stakeholders over the coming months and considering its implications.



Consumer trends

The world population is expected to grow by a further billion by 2030 to 8.5 billion, and up to 9.7 billion by 2050

Leading to big questions around how the world will feed itself, the U.N., governments and the private sector are looking for solutions and searching for the next innovation that could help create scalable food production.

Climate change and general health issues are adversely affecting red meat

There is also an accepted narrative that meat production has an adverse effect on the climate and too much meat is not necessarily good for your health. Consequently, a movement has emerged where scientists, academics, governments, philanthropists and even commercial businesses are seeking ways to solve and take advantage of these challenges.

Population growth and a new cultural narrative is creating new needs and behaviours around food

India, Sub Saharan and China are the countries primarily driving global population growth. In these countries, people are wanting to consume more protein and red meat. It is not clear at this stage what long term attitudes these countries will have towards red meat as they develop. These new markets may; 1) follow western eating patterns; 2) remain traditional; or 3) evolve to create a new way of eating and set of consumer needs, behaviours and expectations.

Amongst Chinese consumers, feelings around red meat are conflicting. From a Chinese medicine perspective, it is generally encouraged to only eat small proportions of red meat, but sheep meat is viewed as having a “warming” positive quality. Eating red meat is also viewed as a sign of affluent sophistication. Despite these conflicting perceptions, demand for high quality, imported red meat in China is currently very strong.



- Health conscious consumers are increasingly seeing meat as either a comfort food or an indulgence
- As an indulgence, it is reserved for special occasions, with quality and premium a way to ensure the best experience
- As a comfort, it is an integral part of social occasions and heritage, from barbecues to stews

Consumers in developed markets around the world are reducing their meat consumption

In developed countries, there is a growth in vegans, vegetarians, and flexitarians. However, in some countries the increase in vegetarians has slowed after reaching around 20%.

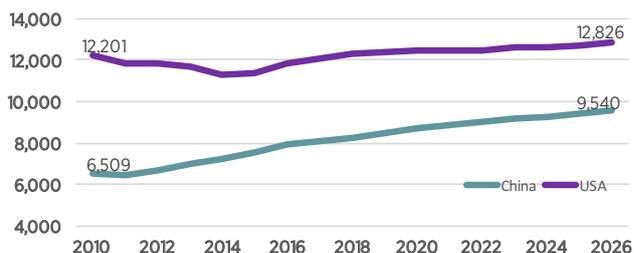
In addition, there is a large group of consumers who don't identify as being a non-meat eater even though they have significantly reduced their animal meat consumption, including “meat-free days” into their lifestyle. However, when these consumers do eat meat, they are looking for quality and are prepared to pay a premium for it.

As grocery, Quick Service Restaurant (QSR) and Casual Dining Restaurants strive to stay relevant, even the most traditional burger joints are exploring vegan and vegetarian options to cater for the “veto vote”. That is, catering for the member in the party who convinces the group to go to another restaurant because they offer a vegetarian option and the (burger place) does not.

Or in the case of a vegetarian place (e.g. Veggie Grill), they offer an acceptable meat alternative (e.g. Beyond Burger and Santa Fe Chicken Sandwich) to cater for the meat eater in the group.

Despite some of these trends, red meat consumption in the US is still very strong and is currently forecast by the OECD to remain around current levels to 2026.

Beef consumption (thousand tonnes)—China vs. US



Source: OECD



- Red meat is used for specific Traditional Chinese Medicine (TCM) purposes, such as pregnancy, cold physical dispositions or enhancing strength
- These uses put a natural cap on red meat consumption, as it needs to be limited in other occasions and only used for specific situations
- Beyond TCM, red meat becomes an indulgence in a similar way to the West, saved for special occasions and as part of exploring food experiences



Industrialised meat (e.g. grain fed indoors) has tarnished all meat, even meat that consumers acknowledge as being better (e.g. grass-fed outdoors)

In recent years, the consumer has become more aware of the industrialisation of meat production and the perceived negative impact it has on the environment, animals and human health. This has been primarily driven through the proliferation of documentaries and mainstreaming of animal ethics and climate change via social media. The presence of images and videos in social media mean that a sense of shame is developing around consuming mass-produced meat, leading to both personal and social reasons to reduce meat consumption.

The more informed consumer understands not all meat is equal and even cite the benefits of grass-fed, or European, Australian or New Zealand meats being different to the more industrialised meats of the North America. However, many lack this level of sophistication, and as such, this narrative has not been widely adopted yet.

In Asian markets, this sense of concern around industrial farming is less pronounced, although there is evidence Western attitudes are beginning to influence Chinese consumers.

The language of meat has changed: consumers don't always think about meat, they think about protein in their diet

Historically the primary source of protein for consumers was meat, and nutritional guidelines included language such as meat and meat equivalents. For the last 8-10 years, there has been a movement towards consumers adopting the language of protein and instead of seeking meat as the primary protein source, they have introduced other products into their diet to get protein. These include for example whey protein powders and more recently pea protein powders added to foods such as cereal, bars, juices and even chocolate.

This shift in language has resulted in consumers thinking about meat or red meat specifically as being one of the many sources of protein that are available to them. Red meat remains relevant as a component of meals, thanks to its strong cultural heritage and the nutritional benefits it provides. Meat substitutes currently intrigue people and are seen as a good thing to consume for the planet but lack the indulgence and experience associated with red meat.

The plant protein story is easy for consumers to understand and adopt

The plant protein story is a simple story that most consumers can quickly understand and get their head around—plant-based food was named a top trend of 2016. In addition, plants are perceived to be healthier, thanks to decades of positive messaging around vegetables and an online culture of positivity around plant-based diets. They are also seen as better for the environment.

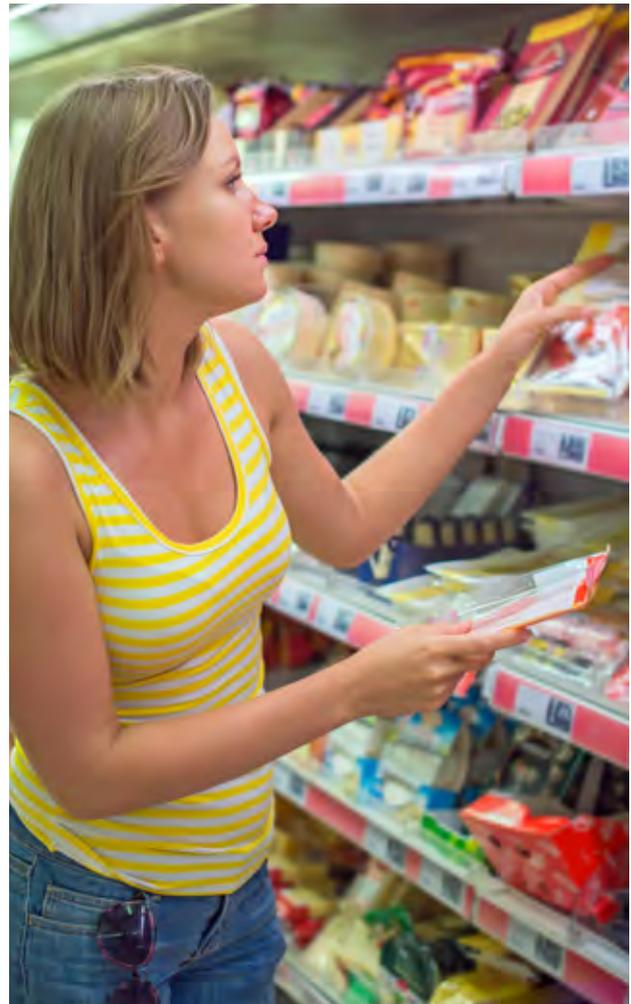
This narrative is often enough to push consumers to adopt “meatless days”, reduce their red meat consumption and even adopt a fully plant-based diet.

There is some concern about the ultra processed nature of alternative proteins, but the prevailing image of alternative proteins at present is of being “clean meat”.



The new alternative proteins are sophisticated in terms of business operations, food technology (R&D), marketing, brands, and are a viable threat to the meat market

There is a perception from industry leaders in meat production, consumer foods, dining and grocery that Beyond Burger and Impossible Burger are different from their predecessors. The vastly improved meat sensory experience of the Impossible Burger is considered to be a game changer. The operational, brand building and consumer facing practices of Beyond Meat and Impossible Foods are highly sophisticated and likely to drive change for all non-meat products.



Some farmers and meat companies in the US and Europe have already taken strategic action to move away from meat production

On a small but noticeable scale, some US and European farmers and meat companies have already taken affirmative action to move away from animal protein production and invest in the alternative protein market. This is most commonly seen by changing their farming practices, moving into new crops (where climate and soils allow) or, diversifying their portfolio and investing in nuts or alternative protein companies such as Beyond Meat. US farmers have also indicated that their shift away from livestock production is in reaction to not being best placed to deliver on new consumer needs. i.e. grass-fed premium meat.

Attitudes towards red meat reveal a number of negative perceptions

From our consumer research across the US and China we identified a number of emerging views on red meat, with a surprising level of consistency:

THEME	HEALTH	WELFARE	ENVIRONMENT
	<ul style="list-style-type: none"> Believe it is a medical fact that red meat is bad for you, carcinogenic and bad for the heart, due to widely shared stats/infographics Digested slowly leading to lethargy Full of antibiotics and steroids 	<ul style="list-style-type: none"> Images and videos have created a view of the red meat industry as dirty and cruel Low welfare can clash with personal and social values Concern that poor treatment = unhealthy meat 	<ul style="list-style-type: none"> A more academic concern, with most aware of the effect on greenhouse gases and a smaller number aware of water and land statistics Awareness increases as environmental impacts are felt, e.g. the fires in California
	<ul style="list-style-type: none"> According to Traditional Chinese Medicine, red meat has to be limited Aware of Western views on red meat's medical risks (carcinogen etc) Often eaten for specific health issues 	<ul style="list-style-type: none"> Lesser concern compared to Western views, although still present Increasing awareness of welfare via celebrities 	<ul style="list-style-type: none"> Very conscious of air pollution However, lower concern compared to the West Celebrities could increase awareness

Red meat consumption is becoming more specialised and niche, but opportunities still exist

In both Eastern and Western markets, the views towards red meat are mixing with cultural factors to start to push red meat into narrower niches. However, this also comes with opportunities, namely clear positions for red meat to own.

For example, in the US, retail sales of fresh grass-fed beef have been doubling every year reaching US\$272 million in 2016, up from US\$17 million in 2012.

If alternative proteins do gain traction in burger production, it is important to note that 100 million hamburgers are sold each day in the US. There is also a growing category for high-end premium burgers that are still likely to want grass-fed beef.



And demand is still growing in many countries.

The Middle East has significantly increased its imports of chilled beef, with an increasing appetite for prime cuts thanks to its affluent middle class.



Egypt doubled its imports of Australian beef between 2013-2014

Chinese adoption of Western cuts has led to increased premium imports of these products. While the volumes are still small, the prices some Chinese customers are willing to pay for top quality chilled meat is very high.

Traditional Chinese cuisine also uses cuts that are not as popular in western countries such as lamb flaps in hotpots.

Chinese customers are willing to pay a lot more for these cuts than western countries and this has significantly increased the overall return that it is possible to get from a whole carcass.



The rise of alternative proteins

Broadly speaking three methods of producing alternative protein have emerged.

The core methods include:

- Using alternative plant-based sources to create products that are indistinguishable from animal products —mixing known ingredients together (e.g. Beyond Burger) or extracting protein at a molecular level and reconstructing a product (e.g. Impossible Burger)
- Culturing meat products using stem cell technology
- Sourcing or farming novel alternatives and using a process to create a protein rich ingredient (e.g. cricket powder)

Consumers are intrigued by plant-based meat substitutes, although suspicion around their ability to provide a genuinely like-for-like experience has put off many from switching to these products en masse yet. A key challenge for these products is replicating the fat balance of meat, with “juiciness” and this is often reported by consumers to be “lacking”. These new alternative proteins are, however, a vast improvement in terms of taste from their predecessors, and are becoming established.

It is important to note that even if the taste experience does not directly replicate the animal protein option, it is possible that consumers may develop a taste for the new product, and as such will not consider products such as Impossible Burger and Beyond Burger as being a substitute for a meat burger but rather a new food to add to their repertoire.

Cellular meat is more problematic for consumers, as it may conflict with consumer ideals around genetic modification.

Consumer knowledge of novel protein is currently low and it is challenging for many to accept eating the powder of insects.



Retail landscape

The protein landscape in US grocery stores is changing and it is expected to continue to follow the current growth trajectory.

The alternative protein space is small (10-20% of its conventional counterpart), but is growing rapidly (growing 4-10 times faster than conventional proteins). In parallel, the premium end of the animal protein market is still growing.

The main barrier to significant growth in alternative proteins in the grocery sector is attributed to the lack of options available—most notably they can't have a 4-foot wide space in the aisle (or refrigerator) until a variety of products exist.

Currently, cellular meat is not on the radar for mainstream grocery—it is too far away from production.

Quick Service Restaurant landscape

The casual dining and fast food industry have indicated that if alternative proteins can increase their production capability, and if there is consumer demand, it will not take a lot for them to shift their menus and offer these products as alternatives on their menus.

The US food industry (including grocery and dining) believe there is increasing consumer demand for alternative proteins and it is only a matter of time before they achieve mass production, wider distribution and more competitive pricing.

A few key facts about the alternative protein companies (and their products):

- The primary stated goal of most alternative proteins is to reduce the environmental/ climate impact of producing traditional proteins, and offering alternative ways to feed the ever-growing world population.
- The product sensory and overall consumer experience is on a continuum of constant innovation and improved products are scheduled for release.
- Investors and founders of alternative protein products are motivated by philanthropic reasons and consequently the metrics for success are not primarily financial.
- Alternative protein companies are technology based companies and as such are willing to run at a loss until they achieve proof of concept and critical mass.
- Alternative protein companies are currently focusing on volume opportunities e.g. mince and it is possible they may never be able to proceed to manufacturing cuts e.g. beef steak. Sheepmeat cuts have not even been looked at yet.
- Cellular meat uses expensive medical grade equipment and is at least five years away from proof of concept for a commercially viable option.
- Creating muscle tissue (e.g. steak, tenderloin roast) is seen as the ultimate challenge and they all are working on it with enthusiasm.
- For the technology to evolve to producing muscle, significant technology breakthroughs are required in food and other technologies e.g. 3D printing and co-culturing.
- The current limited distribution of alternative proteins is primarily thought to be due to production capability and not a lack of demand.
- Currently all products are premium priced although all are achieving significant reductions in cost year on year, and continue to seek ways to reduce the cost of production.
- Products that are made from known ingredients (e.g. beets, peas), have been quickly and easily approved for safety by the FDA or equivalent. Whereas products that involve heavy processing or a scientific approach (e.g. molecular protein extraction) are still under evaluation.

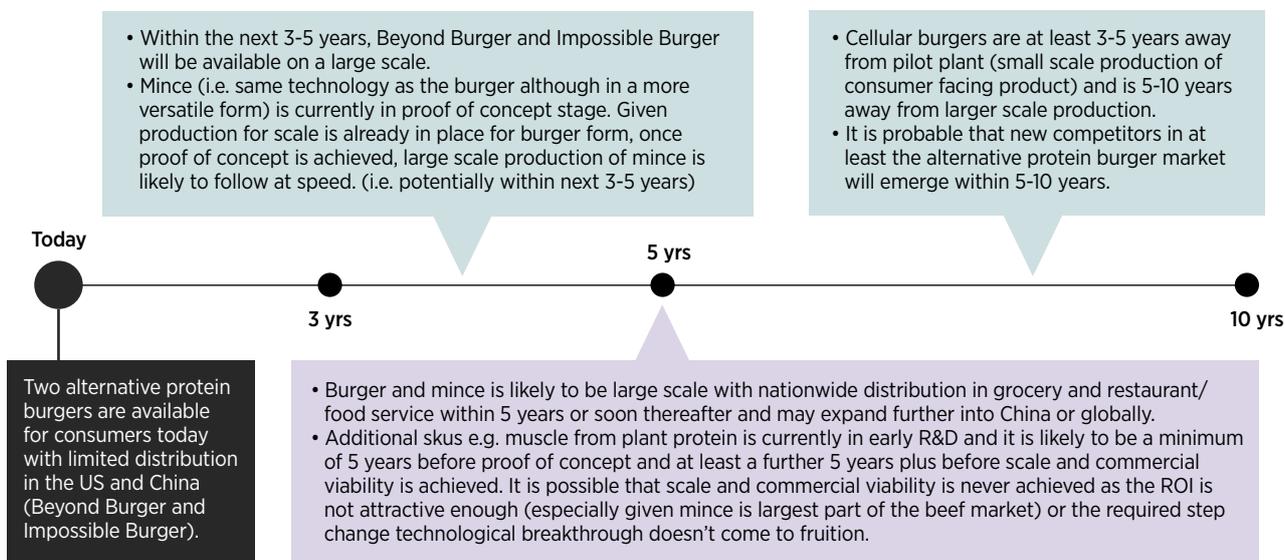


Overview of current alternative proteins and consumer perceptions

Brand/ Company:	Beyond Burger	Impossible Burger	Memphis Meat	Insect Flour	New Wave (SEAFOOD)
Product Type:	Plant-Based Burger (competes with beef burger)	Plant-Based Burger (competes with beef burger)	Exploring range of meats, initial focus chicken	Ingredient to be added to other foods e.g. bars, cakes, medical nutrition	Shrimp alternative
Tech-nology:	Mixing known plant based ingredients together to create a beef patty form	Extracting the protein molecules from plants and building a product from the protein molecules up	Cellular based	Raising, roasting and grinding from insects such as crickets	Extracting the protein molecules from plants and building a product from the protein molecules up
Nutritional Profile:	(4-oz. patty) Calories: 290 Total fat (g): 22 Saturated fat (g): 5 Cholesterol (mg): 0 Sodium (mg): 450 Protein (g): 20 Iron (Daily Value %): 25%	(3-oz. patty) Calories: 220 Total fat (g): 13 Saturated fat (g): 11 Cholesterol (mg): 0 Sodium (mg): 470 Protein (g): 21 Iron (Daily Value %): 10%	Proposed to be as per its traditionally raised equivalent	Superior protein source	Proposed to be as per it's traditionally raised equivalent
What experts say about nutrition:	Expert: Good source of protein although not a direct substitute.	Expert: Not as good as real thing due to processing	Expert: Not as good as real thing due to processing	Expert: Good source of protein to add to mix	N/A
Claimed Benefits:	Climate, animal welfare and general health	Climate	Climate, animal welfare	Climate and health	Climate, animal and human welfare
price:	\$5.99 2 x 4-oz patty	Premium circa \$4 above regular burger price	Not commercially available. Have significantly reduced cost of production at proof of concept stage	\$12.38 (Premium at 25-30% more than other organic powders)	Planned to be premium although not as highly priced as wild caught shrimp
Consumer Research:	Plant-based Protein		Cultured Meat	Novel Protein	
USA	<ul style="list-style-type: none"> • See it as a healthier, more sustainable alternative to red meat • Appears to be successful as a substitute for home cooked comfort meals with strong flavours • Less common as an indulgence or for special occasions 		<ul style="list-style-type: none"> • Seen as related to GMO, which creates health concerns • Worried about additives such as steroids, hormones and antibiotics 	<ul style="list-style-type: none"> • See this as more of a curiosity than a genuine alternative to red meat • Aware of consumption outside of the USA but few have experienced it 	
CHINA	<ul style="list-style-type: none"> • Seen to be the most natural alternative to red meat • Intrigued and excited about the possibility • Some concerns around the product experience delivering a meat like experience 		<ul style="list-style-type: none"> • Dislike the idea of something created in a laboratory • Worry about the chemicals involved • Concerns around the long term effects of consumption 	<ul style="list-style-type: none"> • More accepting of the idea of eating insects as a way to get protein, although tend to be specific about varieties (dislike crickets) • Algae is already part of the diet so eating it is not a concern 	

Estimated timeline for the potential evolution of current alternative protein technologies

The following is an estimated timeline for the potential evolution of beef alternative protein technologies. Changes in financial investment, regulations or technology advancements (or setbacks) will affect estimates.



Potential counter-forces to alternative proteins

The rise of alternative proteins could be slowed or it could change direction depending on how counter trends play out. The following are some challenges that alternative proteins may face:

What could happen to turn consumers against protein alternatives?

As almond milk has gained traction, it's started coming under pressure as the health industry examines its nutritional content and environmental impact.

There was a time when margarine was considered the healthy option, until it was uncovered that the trans-fats within margarine cause a significant risk for heart disease.

A health scare could stop the progress of any new innovation as it takes years to build back consumer trust.

What could happen in the market to slow growth and development of alternatives?

Many economists believe the US economy will experience a market correction in the short-medium future.

Depending on how a market correction hits consumers, it may cause a cut back on spending right when alternatives are gaining some traction.

Also, most of the investment into alternatives is coming from Silicon Valley, which is known to be fickle with investment dollars. They could slow investment if better/newer investment opportunities emerge elsewhere.

Most of the alternatives are heavily reliant on processing plants that are not yet at scale in terms of production capability. Currently all alternatives are far away from scaling to a level that would be necessary to keep prices affordable and accessibility wide spread. If they don't reach scale quickly, consumers could move onto something else.

What could happen if alternative protein products fail to deliver?

Even if consumers want to eat alternatives, they won't adopt them at scale until the taste and sensory experience meets their needs and expectations. The taste of alternatives must appeal to a broad, mainstream audience.

What could happen within government bodies to shape the adoption of alternatives?

The long-term health and safety effects of the Impossible Burger (and cellular meat) are unknown, therefore regulators might be very slow to approve them without years of additional testing. Currently, there is no agreement on how to conduct these tests as the food is changed on a molecular level.

Potential for alternative proteins to disrupt segments of the red meat market

Whenever disruption occurs, it is preceded by a series of signals or forces. These can be quite weak or might even feel like they pass in a flash—so it can be hard to determine if they are really happening or if it is just media hype. Disruption happens when these signals gain traction, get stronger and all converge at the same time.

At present, we are seeing these weak signals gaining traction and momentum, suggesting they are at the point of converging at the same time—making disruption a possibility.



The seven forces of disruption

We have identified seven forces that are driving disruption to the red meat market. These include:



Global and government institutions have put the impact of meat consumption on the agenda

As always, progress will be slow, however, the conversation has started and they are beginning to take action to reduce the consumption of meat and address environmental concerns, and the actions of individual countries will eventually impact global imports and meat consumption.

“

The FDA and USDA will approve these new proteins, we will have to. We have a responsibility to provide food for the American people, to make sure it is available—plus we have a job to create a market for agribusiness both here and abroad.

-Expert Interview, Gov't



2

There is growing support for a plant-protein based diet from the medical industry

Plant based diets are gaining momentum and going mainstream as reputable sources of medical information and health data are promoting a diet of less meat and more plant protein.

“ *There is a pretty good percentage of the population, and by all accounts that appears to be growing, of people who would rather not eat meat if they can help it. It's a consumer we don't want to lose, even for a burger chain.*

-Expert Interview, QSR industry



3

There is a steady flow of investment capital and Big Foods, Venture Capitalists and Investors are increasing both the size and speed of their investment in alternative protein

- Investment dollars are on the increase and the individual investors are powerful and influential on a global scale
- Big Foods have a vested interest and bring their infrastructure and expertise in building brands and getting products to market
- There is a perception from industry leaders in meat production, consumer foods, dining and grocery that alternative protein companies like Beyond Food (i.e. Beyond Burger) and Impossible Foods (i.e. Impossible Burger) are different from their predecessors.
 - The improved product sensory experience of the Impossible Burger is considered to be a game changer.
 - The operational, brand building and consumer facing practices of Beyond Meat and Impossible Foods are perceived to be highly sophisticated and driving change for all non-meat products.

The convergence of all these investors means the potential upside has become too valuable to ignore and it is likely to only be a matter of time before further technical breakthroughs mean mass production and scale is achieved.

4



The technology to produce a consumer ready alternative protein burger is here and is pushing for commercial scale

- There are multiple competitors, with more likely to enter the market, pushing the race to achieve wide spread consumer acceptance, mass production and distribution forward.
- For now, the technology is limited to mince and the market is niche, and only available in specialised locations, but it's quickly gaining traction and there is a strong effort to innovate the product.
- While there are currently three core approaches driving development in alternative proteins, it is likely that more will follow as the technology fragments, additional novel sources are discovered and hybrids are created
- Each approach has made substantial leaps in technical development as well as commercial and consumer acceptance. And while each approach has hurdles to jump, they are actively and aggressively addressing barriers to growth and consumer acceptance.
- While the technology is advancing, it is unlikely that it will reach mass scale in the immediate future, however when we put these advances together, we see a rapidly changing future—especially in the US mince beef (and burger) market.

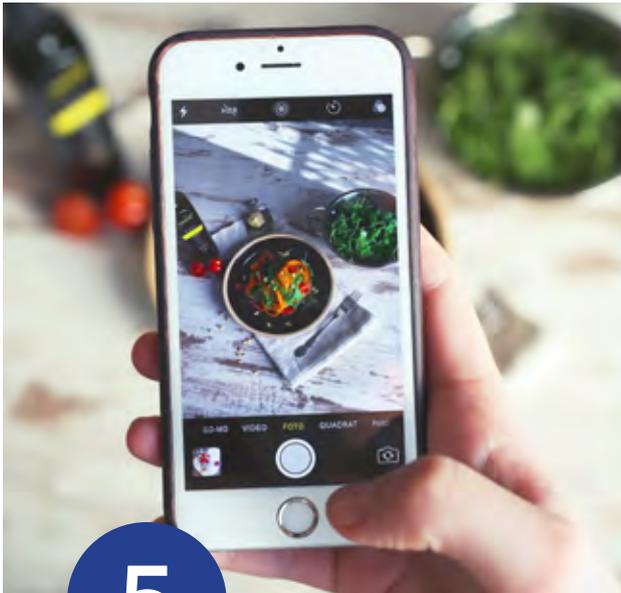
“ As a scientific challenge [making muscle] this is very appealing, very challenging, something we want to figure out how to do, the other [making mince] is the kids pool. Anyone with a mixing bowl could’ve made mince, whereas this other piece—this we definitely want to solve it!

- Expert Interview, Alternative Proteins

While the technology is advancing, it won't reach scale in the immediate future

The following is an estimated timeline for the potential evolution of beef alternative protein technologies. Changes in financial investment, regulations or technology advancements (or setbacks) will affect estimates.

	Today	3 yrs	5 yrs	10 yrs	20 yrs +
BEYOND MEAT	Small scale production with limited distribution in grocery and regional distribution in casual dining Limited availability in China (HK)	Full scale production with greater regional distribution grocery and casual dining Increased availability in China	Increase in production facilities with potential for national distribution in grocery and casual dining		Potential for next generation production
		Potential for further global expansion and non US production facilities and next generation skus			
IMPOSSIBLE	Pilot plant production with limited distribution in casual and showcase dining	Full scale production with extended distribution casual dining and food services	Multiple production facilities with potential for national distribution in grocery and casual dining		Potential for next generation production
		Potentially grocery (dependent on R&D sensory development of behaviour in fridge) and next generation skus			
CELLULAR	Proof of concept		Pilot plant		Commercial potential



5

A new set of influencers are creating a new cultural narrative around meat

- Athletes are starting to push the performance benefits of plant protein diets
- Cultural influencers are moving the conversation from being about animal ethnics alone into a mainstream dialogue about health benefits and sustainability.
- Aspirational influencers are making this conversation cool and creating followers
- What used to be a small, niche movement to abandon meat (based on ethics) has become a cultural narrative led by mainstream influencers that pushes the reduction of red meat as a mindful, health-forward lifestyle choice rooted in building energy, power and performance benefits. The alternative protein conversation is gaining momentum and becoming mass market.

“ I think we’re going to be growing vegetarian and loyal non-animal protein eating eaters...I think we’re not even up the hill yet to the tipping point. We’re still on the ride.

- Expert Interview, Grocery



6

Millennials eating patterns are reshaping the food industry

Millennial’s social values, holistic wellness goals, prioritisation of experience over product, new eating patterns and the sheer size of this group is driving change.

“

Our guests are better educated on food and sourcing, they are proactively and intentionally incorporating more veggies, fruits, wholegrains and nuts into their diet.

- Expert Interview, QSR

“

The consumer market for these alternative proteins is not in any way as limited as what a gluten-free market was originally. It’s broader. It’s a complete food movement.

- Expert Interview, Grocery



7

The market is responding to consumer demand for new products that meet evolving needs and desires

- Niche products are available in the mainstream grocery stores and supermarkets
- Quick service restaurants are offering alternative proteins and more meat-free options
- In select locations, alternative protein is starting to sit beside real meat in the grocery aisle
- While distribution is niche, the key players are pushing hard to expand distribution

Mainstream adoption proves there is consumer demand for reducing meat, getting protein from other sources and changing the way we eat.

“

The growth has been monumental. When I say that, obviously a small base but the percentage movements are huge and with big CPG getting behind it, like Beyond Meat, we are seeing more sophisticated marketing.

- Expert Interview, Grocery

“

It's not big (10-20% of its conventional analog) but the growth is 30-40%, quadrupling and even 10 times what conventional growth is. When the dollar growth matches that, it will become meaningful.

- Expert Interview, Grocery

Considerations for New Zealand

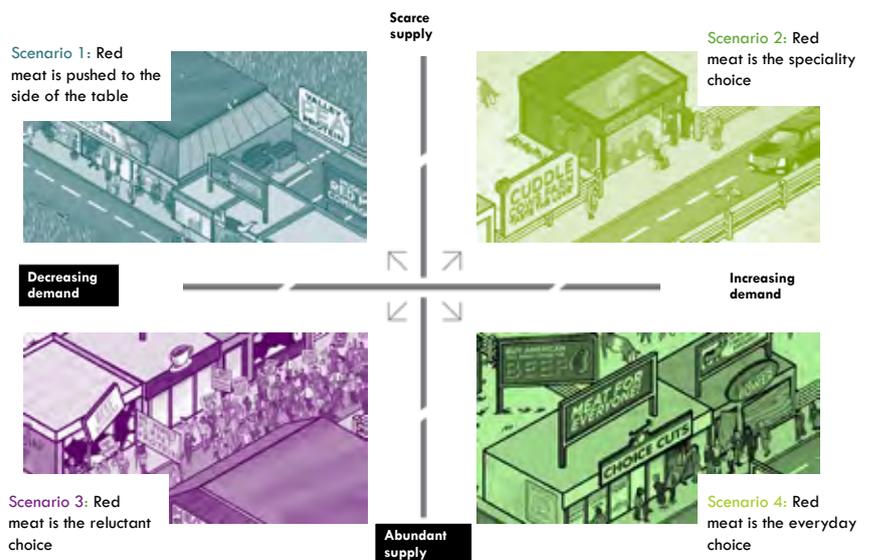
What disruption might look like? How we might strategically respond to it? What are the potential implications for each strategic response?

We don't know what will happen if the seven forces of disruption converge, but we know which core factors will shape the industry. We can use these factors to create 'plausible' future scenarios.

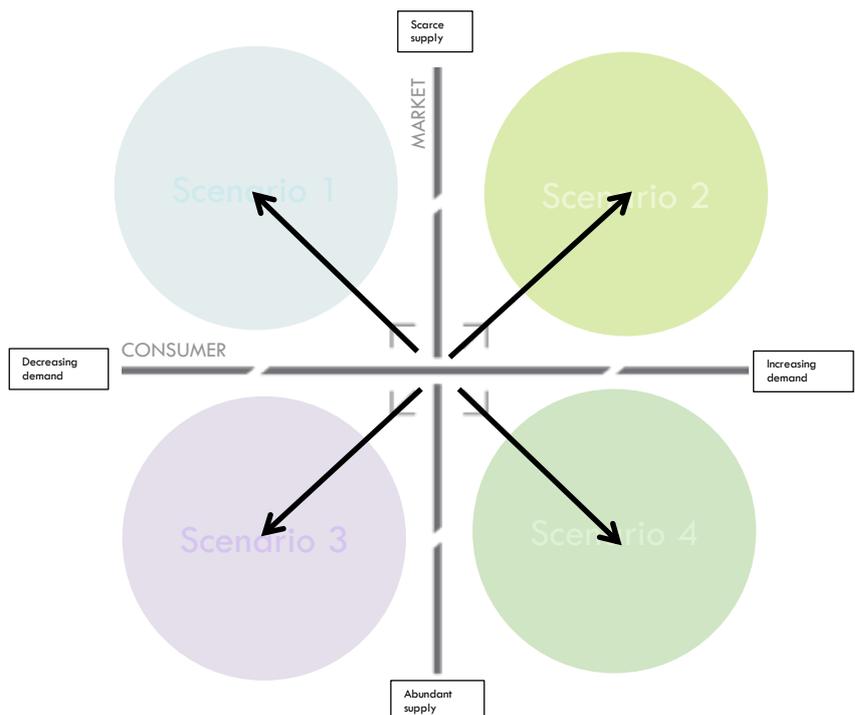
Four plausible future scenarios

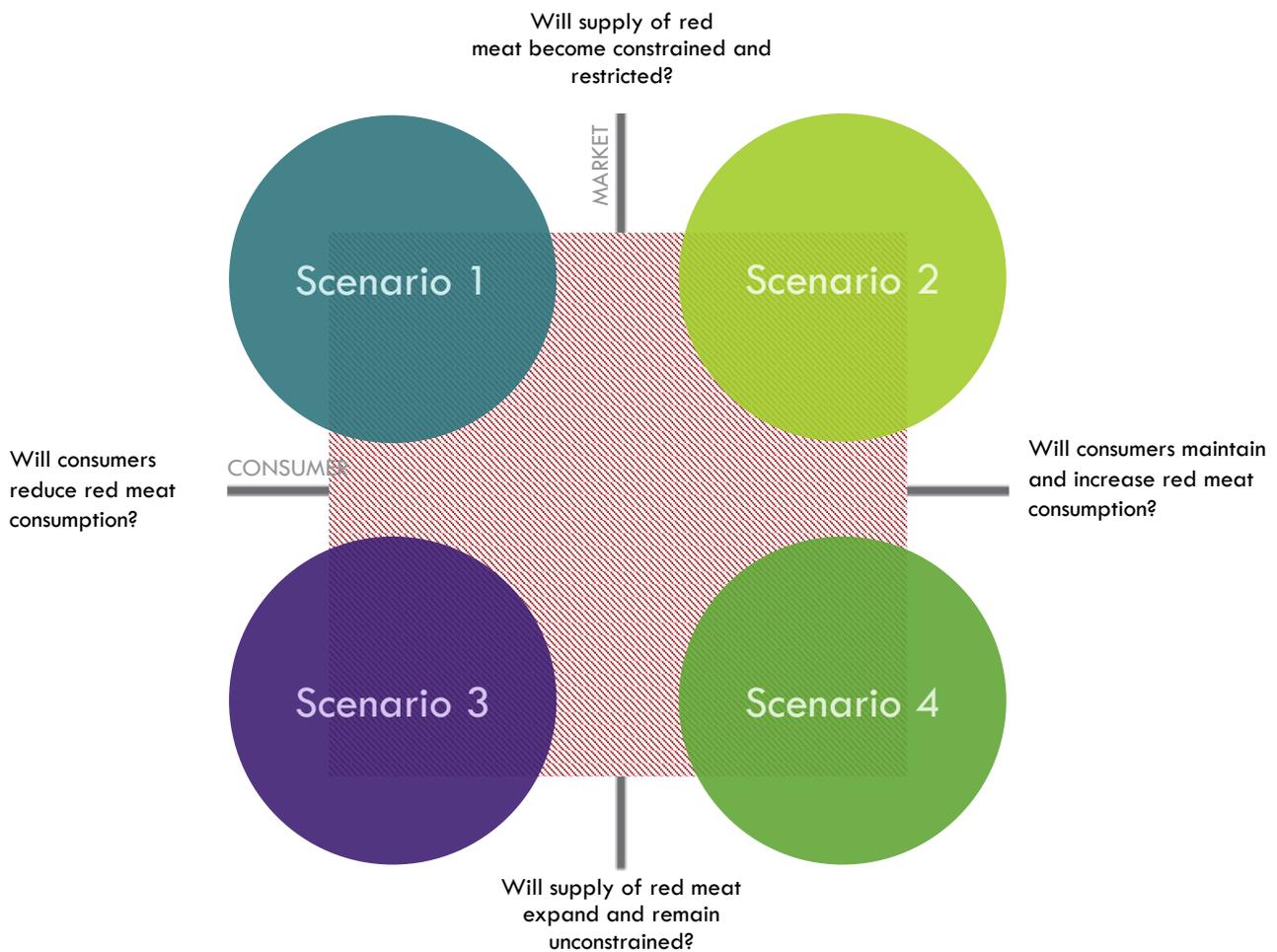
result from crossing the market and consumer factors. Understanding these scenarios helps us consider actions to address the forces of change.

We can use these scenarios to push our thinking to the extremes, propose big "what-ifs", overcome blind spots and create provocations to inspire ideas. This map is not static and as such requires a dynamic and nuanced response that is updated and revisited as the seven forces continue to evolve.



The future reality is likely to be closely to the centre as the scenarios won't play out in isolation, however what might happen is less important—what matters is what we do about it. This is where the strategic responses come in.





We have developed **four primary strategic responses.**

Initially it feels safest and attractive to cover all the strategic responses. However, it's important to focus investment and energy in a particular direction. That's because:

- We need to achieve economies of scale by working in a similar direction
- Each strategic response requires investment, it's better to invest more in one direction vs. less in each (i.e. play to win)
- The strategic responses can be in conflict with each other (therefore if you cover them all, you dilute them all)
- We won't have permission to play in all of them—as New Zealand's objectives, strengths and current assets determine where/how we are best suited to play
- None are absolute and singular—remember they can move and our actions can move them. Think of them as a 'center of gravity'
- While each individual meat company and farmer will align on the strategic response, the solution won't be the same for everyone—there will be actions, which require collaboration, and some that don't
- Each has short-term + long-term actions
- Decisions need to be made up front, but actions can follow in a series of steps versus all at once

Overview of what disruption might look like

Four scenarios: how we might respond; and what the strategic responses could look like

Scenario:

What the disruption might look like...

Strategic Response:

How we might respond...

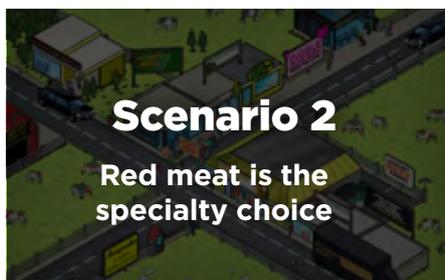
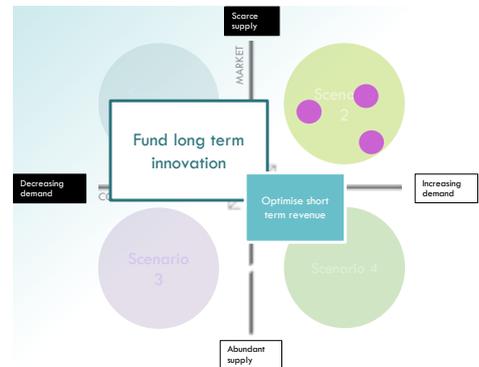


Case study: Dairy Industry



INNOVATE
beyond red meat using funding from short-term revenue growth

Case study: **Elmhurst Dairy**

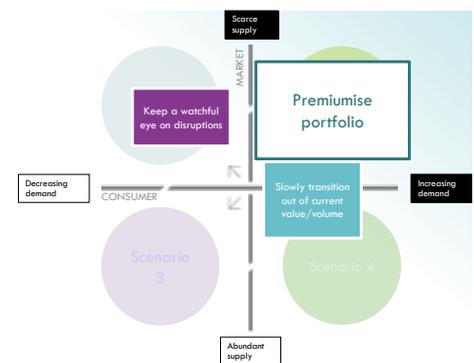


Case study: Bottled Water



PREMIUMISE
by building tiers of value and investing in product development

Case study: **Dairy 1871**

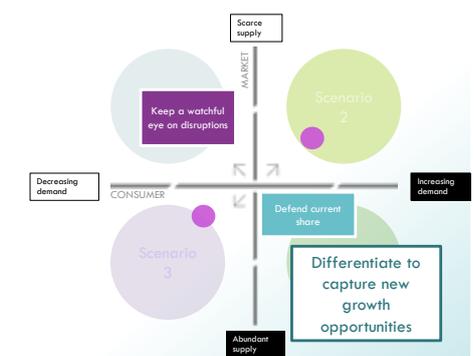


Case study: Coke



DIVERSIFY
portfolio beyond red meat and protect current volume (share)

Case study: **Danone**

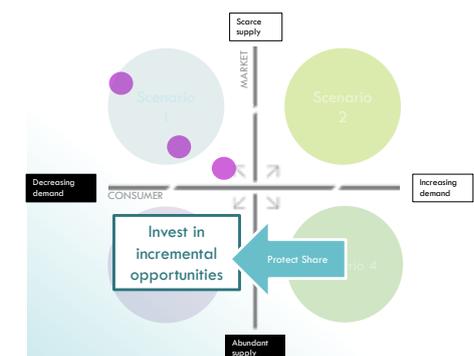


Case study: Wine Industry



EXPAND
and grow share in red meat via differentiation and speed to market

Case study: **Dairy Industry**



A closer look at each scenario and strategic response



Scenario 1: Red meat is pushed to the side of the plate

In this scenario... Red meat is very rarely consumed (only when absolutely necessary) and mainstream consumers have less and less interest in it because they believe reducing consumption helps address any ideological need (e.g. climate issue—they are doing their part) and consumers believe they can get essential nutrients from alternative protein sources (making the shift from red meat being a win win for them).

Governments' support and investment for alternative proteins means that the technology has advanced—product sensory has improved enough to meet consumers needs (don't feel there is a trade off or has exceeded expectations), it is also affordable and widely available, so everyone can access it.

Red meat only has niche roles for specific audiences e.g. babies, elderly or the infirmed or is produced for non food purposes e.g. medical application.

Bottomline:

Role for animal protein (red meat) for food consumption will only become less relevant, demand and investment/ government support creates a multiplier effect in favour of alternative proteins, shifting meat or cows/sheep to other purposes. There are fewer traditional meat producers and competitors as they shift to other revenue streams.

Case study: The dairy industry offers a cautionary tale

In the dairy industry, the introduction and adoption of dairy-free alternatives has reduced demand for traditional dairy products, forcing the dairy industry to respond.

Almond milk is now America's favorite milk substitute, boasting sales growth of 250 percent over the past five years (2016). During almond milk's rise, the total milk market shrunk by more than \$1 billion.

- Nielsen Consumer Insights Report, Nut Milk

In a nutshell what happened:

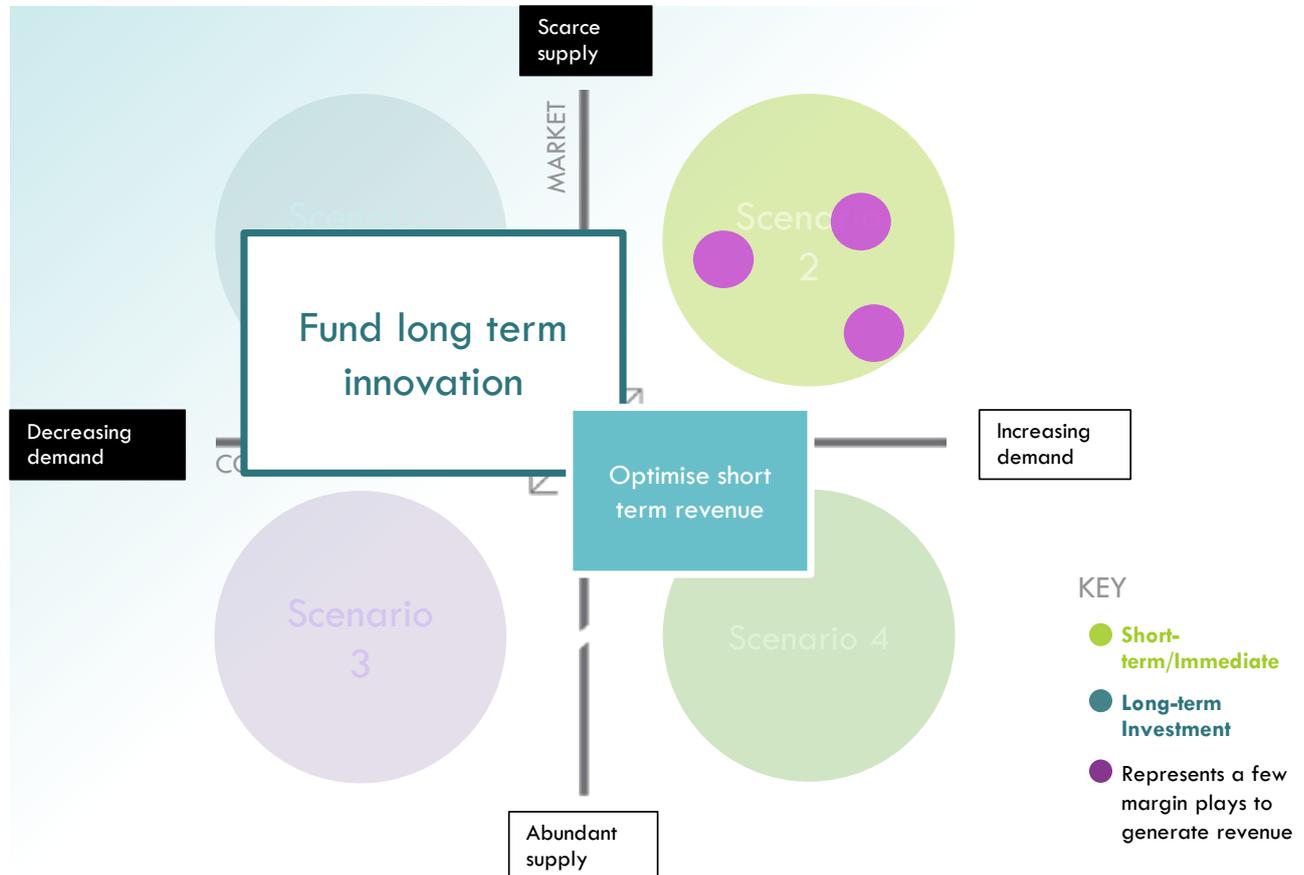
1. Milk was a stable and growing commodity
2. A series of forces collided to shift the market
3. It started slow, niche and seemed unlikely, and then became exponential

The Result: The US dairy industry missed huge revenue opportunities and was slow to respond—so now they have to play defence rather than offence

The (US) dairy industry's plight is a cautionary tale for other industries whose core product falls out of favor or is under attack by activists. It illustrates the dangers of focusing on just one highly commoditized product, ignoring market trends, and trying valiantly to sell what you make rather than to make what people want. The industry has nobody to blame but itself. It's in trouble because it has focused on cows instead of consumers.

- Hank Cardello, Forbes

Strategic response: **INNOVATE** beyond red meat using funding from short-term revenue growth



What this strategic response looks like:

This response is focused on long-term innovation, which includes investing in and creating new opportunities, outside of red meat consumption, potentially beyond food, which could include products, services, or new business models.

Overview of key pros and cons:

- P Potential for high return
- P Very focused
- P Still raise animals
- C Higher risk
- C Fast paced
- C Requires new capabilities
- C Short term profit loss

NZ Red Meat Sector implications:

- This response requires a clear vision and strong leadership. It involves accepting risk and a willingness to manage the potential of short-term loss. While it is still possible to have separate P&L's, the degree of collaboration required can feel at times like there is a joint P&L.
- It requires a very focused objective on where and how to invest (how to shift New Zealand meat sector business) as well as building new capabilities.
- In the short-term it is important to generate revenue to fund investment into the long-term innovation, which is outside of meat consumption.
- Need to expand view of market (i.e. outside of traditional red meat consumption, think about use of farm land, medical, by products or tourism)
- Requires a paradigm shift—imagine new business models
- Need to expand capabilities and skills
- Farmers should continue producing red meat while assessing assets that can be used towards developing future revenue streams (i.e. land - based on soils, climate and aspect, - equipment, relationships, and other resources)

Sample of the actions that would need to be taken to execute:

- Agree and focus on revenue streams that are the most profitable in short-term
- Find partners within to start building R&D capabilities (including in gov't, universities)
- Agree to a focused approach and the trade-offs, losses you are willing to take
- Agree and focus on revenue streams that are the most profitable in short-term

- Invest in a range of diversified streams (don't bet on only one horse)
- Think big and take some risks on opportunities to reimagine business
- Initiate research into new opportunities (i.e. tourism) to being moving toward capturing

Note: For a detailed look at potential actions by stakeholder (meat companies, farmers, government and B+LNZ, refer to the full report.



Case study: Elmhurst Dairy—what they did to execute this type of strategic response

In 2016, after years of financial losses and a continuing decline in the consumption of regular milk, Elmhurst Dairy closed its milk producing plants. One year later, it re-opened and had completely shifted its positioning and business model to focus on vegan nut milks.

What they did:

1. Partnered with an outside expert to create product expertise
2. Created a new product called MILKED and invented a proprietary process for creating nut milks
3. Built new distribution channels in premium stores and direct to consumer

What we can learn:

- It is possible to shift your entire business, Elmhurst re-opened after only about a year away from the business
- Outside experts are necessary to help move into a new industry
- You can't just change your product, you have to adopt a whole new mindset about your business

It's about transforming with the times. As awareness and demand for vegan products continues to grow, we're seeing plant-based options become mainstream.

- Henry Schwartz, CEO Elmhurst.



Scenario 2: Red meat is the specialty choice

In this scenario... As a result of regulation in the form of taxation and lack of subsidies/support, red meat is not widely consumed because it's expensive. In addition there are also cheaper alternatives in the form of less desirable plant proteins or cellular meat.

Desire for red meat amongst mainstream consumers hasn't changed as they aren't worried about the impact of red meat on the environment and they believe they can only get essential nutrients from real red meat. Therefore, they are frustrated they can't have red meat as much as they'd like. Since red meat is expensive and somewhat scarce, they save it for special occasions.

With additional government support, alternative proteins are getting better and more available which is forcing consumers away from red meat and towards other options.

Bottomline:

The red meat market doesn't expand and it gets more and more specialised and uber premium. Margins are higher, customers and markets get ever more specific and segmented, creating value tiers. With ultra specialisation, the number of competitors reduces yet differentiation and ability to compete gets harder.

Case study: Bottled water premiumises to respond to government regulations and consumer pressure

The bottled water industry had to premiumise to grow, as government regulation and social pressure forced consumers to reduce plastic bottles. With less volume, the industry created new occasions and repositioned itself against alcohol to increase margins.

In a nutshell what happened:

1. Bottled water was a volume game providing convenience to consumers
2. Government and activist pressure eventually impacted consumers
3. The industry premiumised, repositioned and created new experiences

The Result: Bottled water didn't panic about losing volume, instead they focused investment and created new reasons for consumers to pay even more for water

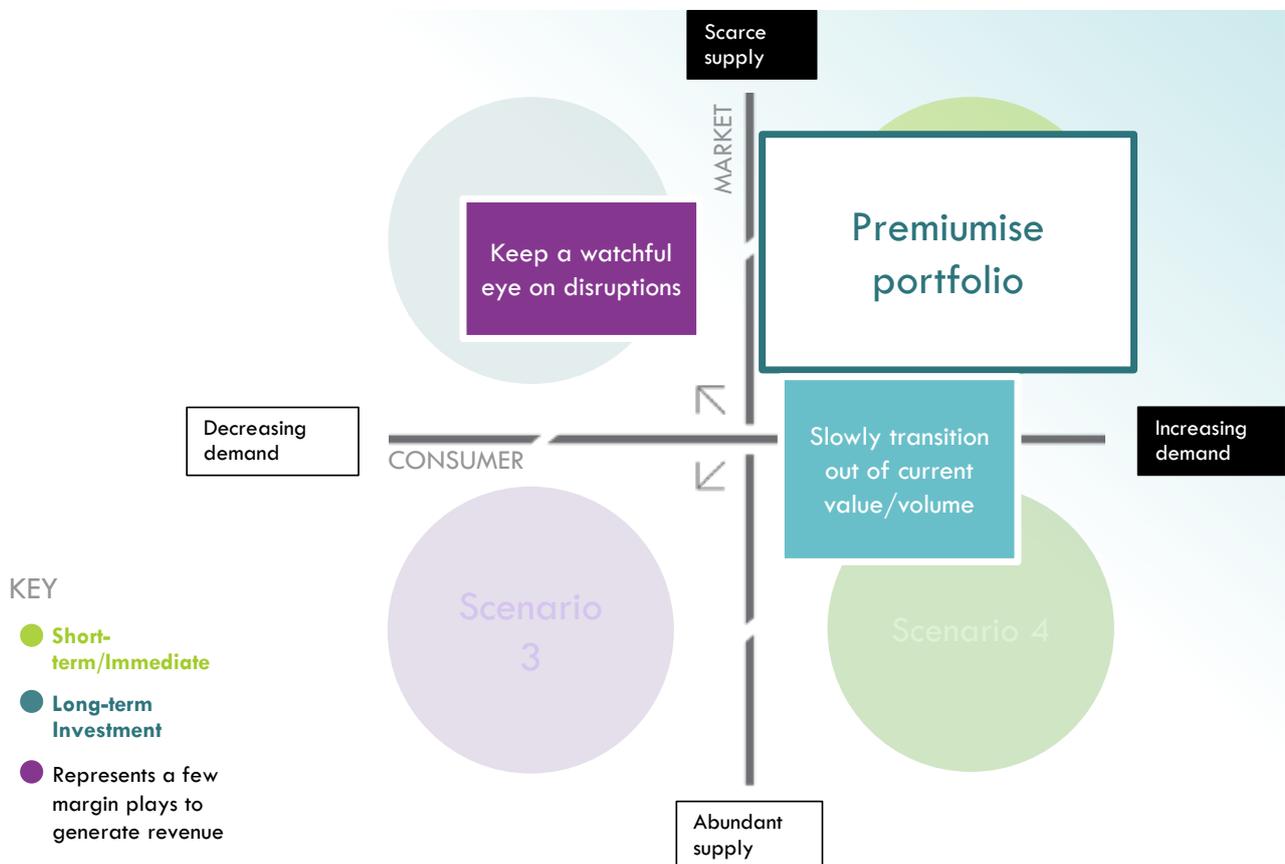
The market is small but lucrative: sales of flavored water amount to only 4% of the volume of plain water sold, but bring in 15% of the total revenue.

- Zenith Consulting, Beverages Market

It could be a fine vodka, on sale for £80 (\$99) in Harrods, an upmarket department store in London, it has a price tag to match. In fact, it is a bottle of water. Harvested directly from Norwegian icebergs that are up to 4,000 years old, Svalbardi is one of hundreds of water brands that are sourced from exotic places and marketed as luxury products. At the luxury end of the market, water has become more like wine, argues Michael Mascha, the author of a guide to fine water. In expensive restaurants the precise origin of water is what matters; many eateries offer water lists along with the wine selection.

- The Economist

Strategic response: **PREMIUMISE** by building tiers of value and investing in product development



What this strategic response looks like:

This response is focused on super premiumisation, which requires building out our existing strong position in red meat to include tiers of value (low to super premium).

Overview of key pros and cons:

- P Very focused
- P Strong capabilities
- C Exposed to market shifts
- C Harder to win
- C High investment required
- C Impact on P&L for dairy

NZ Red Meat Sector Implications:

- This response requires a significant investment in the premiumisation of product (through building tiers of value) and the regulation of agreed premium guidelines. It involves commitment from all parties to adhere to guidelines or accept exclusion from claiming New Zealand produced meat.
- It requires a very focused and coordinated response (everyone has to be in playing by the same rules) and requires giving up some volume opportunities in the short-terms to invest in premiumisation in the long-term. It also requires building a brand and established new premium cues (i.e. bigger than grass-fed and a heightened version of the red meat story).
- Requires a transition away from volume and a shift in focus to margin.
- Requires ongoing investment in product to protect premium position.
- Farmers should explore opportunities to collaborate with other farmers and meat companies to create a coalition around new products, either through unique breeds, unique genetics, or regional relationships.

Sample of the actions that would need to be taken to execute:

- Create guidelines for premium based on capabilities (what does it look like)
- Plan how to coordinate efforts and where/how to invest in building product
- Decide which levels of volume/value to keep and build on
- Invest in product credentials, continue to increase margin
- Invest in strong brand story and in creating scarcity
- Assess other margin opportunities like providing tissue for cellular etc. (watch it)

Note: For a detailed look at potential actions by stakeholder (meat companies, farmers, government and B+LNZ, refer to the full report.



Case study: 1871 Dairy—what they did to execute this type of strategic response

1871 Dairy is an ultra premium micro-dairy in Chicago that produces small batch and artisanal dairy products. They don't sell to commercial processors; instead they bottle their own milk, yogurt and ice cream and sell it directly to consumers. The owner describes his operation as a microdairy because it's like a microbrewery. He hopes to eventually have a tasting bar in downtown Chicago.

What they did:

1. Returning to older artisanal methods of dairy processing
2. Created innovative specialty products
3. Sells to specialty retailers and directly to consumers
4. Supplies grass-fed cow's milk to Michelin Star restaurants

What we can learn:

- This concept isn't mainstream, but the margins are almost double that of normal milk producers at \$7 for a half gallon
- There is an exceptional amount of focus given to the product and proprietary methods
- There is an entire experience created around the product

In this day and age, with the milk market so volatile, farmers have three options: You get a niche and process your own milk, you get bigger, or you get out of dairy farming

- Owner of Micro Dairy Trinity Valley In New York



Scenario 3: Red meat is the reluctant choice

In this scenario... For consumers, red meat has fallen out of favour as they accept and adopt mounting evidence suggesting red meat is hurting the environment and it is not good for the population, as there are other ways to get protein. Consumers are increasingly critical of red meat and are searching for new ways to incorporate alternative proteins into their diets, as they reduce red meat consumption as much as possible. They are also frustrated that red meat is still a necessary source of protein, because none of the protein alternatives are widely available.

Governments are being pressured by consumers to support and invest in alternative proteins. Governments are however still protecting meat industries (and global bodies aren't being taken seriously/ their case hasn't gained traction).

Bottomline:

This is a heightened version of what we are beginning to see today—i.e. incremental change in red meat consumption. In this scenario, the market is fragmenting and being shaped/pushed by consumer demand, and although red meat doesn't disappear, it does become more niche or just one of many protein source options available to consumers.

As the global population increases and correlation between red meat and GDP continues, the volume of red meat consumed increases overall. In response, a wide range of competitors will try to enter the market to capture a share of the volume increase.

Case study: Coke responds to decline in sales

The soft drink industry diversified to respond to the decline in consumption of sugar based drinks. Though it is still widely available and consumers drink it sometimes, most make a concerted effort to reduce.

In a nutshell what happened:

1. Coke had a very streamlined portfolio, with minimal diversity
2. They were forced to respond to shifting demand
3. Coke ultimately had to replace their own products with a new sugar free option

The Result: Coke diversified in incremental stages and through a variety of revenue streams. They allowed their core product to fund their move into new opportunities

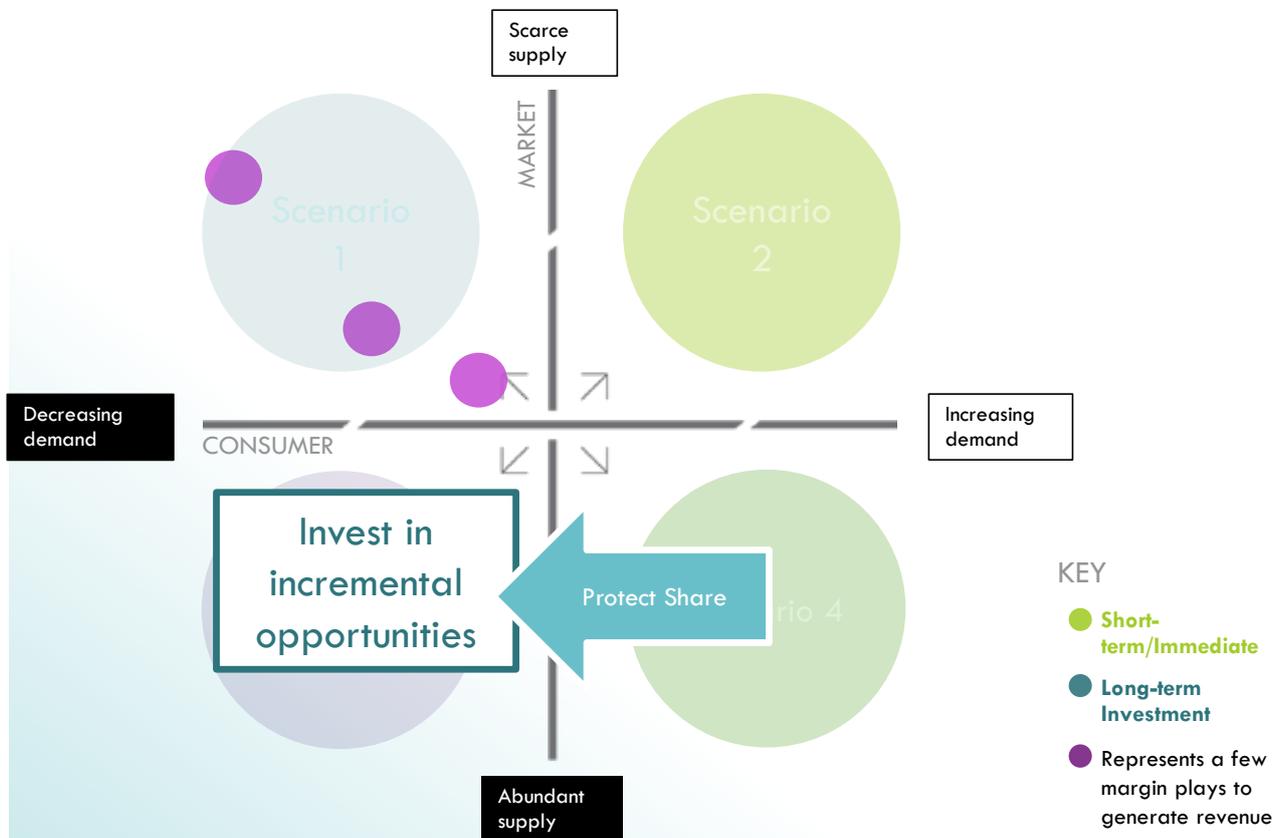
In America the consumption of soda per person peaked in the late 1990s, at nearly 53 gallons per person, and has since declined to about 75% of that level. Last year volumes of Diet Coke, once seen as a fix for more health-conscious consumers, dropped by 4.3%.

- Beverage Digest

As for the firm's traditional products, Coca-Cola is seeking higher volumes in young markets and higher profits in old ones. To propel growth in India, for example, it has developed a new bottle to keep its soda fizzy despite long and bumpy journeys. And in developed markets, where volumes are stable at best, Coca-Cola is making bubbly drinks more profitable through a mixture of higher prices and smaller packages.

- The Economist, 2017

Strategic Response: **DIVERSIFY** portfolio beyond red meat and protect current volume (share)



What this strategic response looks like:

This response is focused on diversification, which could include partnerships, mergers and acquisitions or new product development.

Overview of key pros and cons:

- P** A strategy that is staged over time
- P** Offer diverse opportunities—something for everyone
- C** Pragmatic/less risky
- C** Can make you vulnerable to disruptive innovation
- C** Not one dimensional
- C** A shift away from livestock farming

NZ Red Meat Sector Implications:

- This response will struggle to be effective unless the entire sector pools their strengths and gets behind one core and common goal/objective. It's still possible to have separate P&L's, but actions must be coordinated in the same direction and different players will have different roles (i.e. not all meat companies or farmers will be doing the same thing).
- It requires a common strategic goal across the sector to plan a strategic staged expansion into opportunities outside red meat (incremental growth strategy) and a shift to secondary industry (manufacturing behaviours) with new revenue streams outside of traditional red meat sources.
- Partnerships, acquisitions and new product development investment is required
- Minimal, focused long-bet innovation (as it is staged longer term innovation likely to follow off the back of initial innovations, as this response assumes no-one has cracked alternative protein product sensory yet)
- Shift away from farming livestock and selling animal proteins
- In the short-term, it's important to protect share, while in the long-term, it's important to build a repertoire of products that meet a range of consumer needs.
- Farmers should create a product strategy to optimise value products and shift to producing premium products, either through unique breeds, unique genetics, or regional relationships. Explore direct to customer strategies.

Sample of the actions that would need to be taken to execute:

- Focused plan around how to protect current share
- Determine best opportunities for diversification + plan for capturing
- Agree to common goal/objective and assign roles/responsibilities including timing
- Identify steps in pragmatic approach and timing of each party

- Invest in new opportunities that meet shifting consumer needs
- Develop a diverse portfolio of revenue streams
- Figure out who is best suited to make a few long shot bets
- Focused plan around how to protect current share

Note: For a detailed look at potential actions by stakeholder (meat companies, farmers, government and B+LNZ, refer to the full report.



Case study: Danone—what they did to execute this type of strategic response

In 2012, global dairy giant Danone was growing but had become vulnerable to market shifts (40% of sales were concentrated in Western Europe and consumer tastes were shifting—per capita consumption of milk has dropped 13% in the US over the past five years). They spent five years repositioning their portfolio to be completely focused on health and wellness.

What they did:

1. Acquired Dairy-Free Brands by purchasing WhiteWave foods
2. Built a more sustainable supply chain for remaining dairy portfolio
3. Invested in future opportunities for dairy hybrids

What we can learn?

- This was rooted in an over arching objective to reposition the company to meet shifting consumer needs
- It took place in stages over a five year period and it still continues today
- They had to look at shifting all areas of their business from product to supply chain to a lot of investment in R&D

This is really about resilience, over all, and therefore the long-term adaptation of models of agriculture and eating and drinking practices”

- Global CEO, Danone, Emmanuel Faber



Scenario 4: Red meat is the every day choice

In this scenario... Red meat is still widely consumed and mainstream consumers aren't asking hard questions about its impact on the environment. The belief is that essential nutrients can come from real red meat and can therefore justify their decision to maintain and/or increase consumption.

Governments are protecting red meat industries and global bodies haven't taken collective action to build a case connecting red meat consumption to the climate crisis, nor are they actively supporting alternative proteins as the preferred choice to feed the growing population.

Meanwhile, technology hasn't advanced enough to put alternative proteins on the consideration set for consumers who desire and prefer real red meat.

Bottomline:

This is an expanded version of the market today. As the global population increases and correlation between red meat and GDP continues, the volume of red meat consumed increases overall. In response, a wide range of competitors will try to enter the market to capture a share of the volume increase.

Case study: Wine expands despite health evidence

The wine industry has continued to expand even with negative health evidence against it (and alcohol in general), governments are continuing to support and build the industry, while consumers ignore health narratives. It's become a ubiquitous and crowded category.

2017 will see steady growth at around 1 to 3% volume and 2 to 4% in value. Total US wine sales approached \$60 billion in 2016, a 5% increase from 2015. 2016 is the 24th consecutive year of growth for US wine sales.

- Wines & Vines (2017)

In a nutshell what happened:

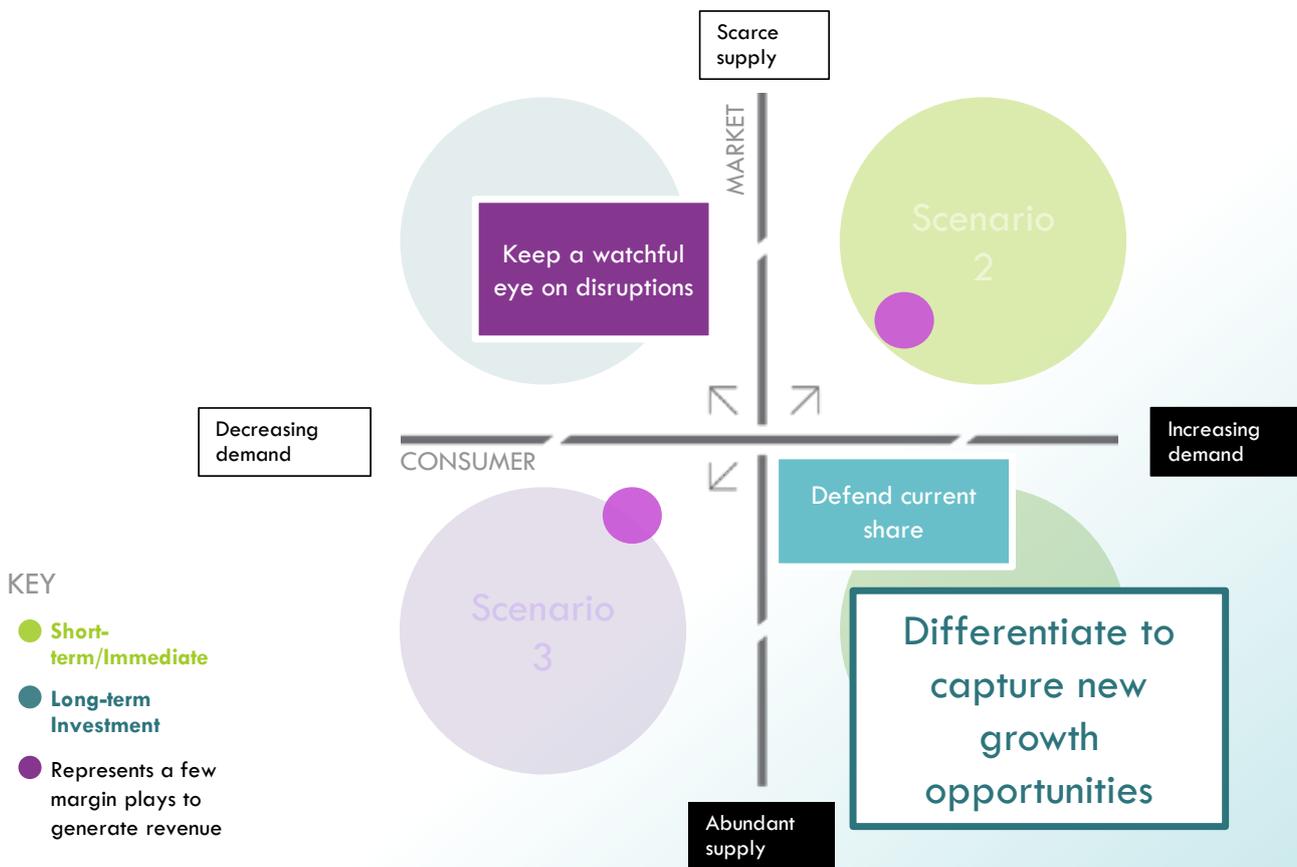
1. Wine was small and not easily accessible for most consumers
2. Local gov't supported the industry to grow it extensively
3. As wine gained popularity, every wine region in the world entered the game

Over 90% of alcohol sales in India in 2012 were of spirits, mostly whiskey. But the wine market in India is growing at 13% annually, faster than that for any other alcoholic beverage. To keep up with the demand, we are adding a million liters of capacity every year. Today we have a capacity to produce eight million liters.

The Result: Wine expands despite health evidence

- Sula Vineyards India, via Wall Street Journal

Strategic response: **EXPAND** and grow share in red meat via differentiation and speed to market



What this strategic response looks like:

This response is focused on targeted expansion and growth in red meat, which means capturing new consumers, increasing volume with existing consumers and moving quickly into emerging markets.

Overview of key pros and cons:

- P Immediate
- P Strong capabilities
- P Still raising animals
- C Exposed to market shifts
- C Erosion of margin
- C Risk of diluting brand

NZ Red Meat Sector Implications:

- This response is focused on targeted expansion and growth in red meat, which means capturing new consumers, increasing volume with existing consumers and moving quickly into emerging markets who may have different and new needs and expectations.
- It requires working collectively in a “co-opetition” way while becoming even more competitive—Collaborate to remain competitive (not cannibalise each other).
- Entering emerging markets with economic force (must build strength in numbers) and dominating growth in chosen markets—speed to market is key as others will also be attracted to growth opportunity
- In the short-term it's important to build brand positioning stories to differentiate and defend share through optimization of all value products.
- In the longer term its important to invest in capturing growth (speed to market) before new competitors emerge. (i.e. in India/China or a region within those large markets).
- This response is completely focused on the red meat market and is therefore very exposed, so it requires watching how innovations emerge and monitor how market moves/fragments to manage long-term risk
- Farmers should explore ways to increase efficiency, productivity and speed of product to market e.g. faster fattening of livestock

Sample of the actions that would need to be taken to execute:

- Move quickly to defend current share through brand positioning
- Build more external relationships to grow into new markets
- Create coordinated effort based on strengths to ensure all opps covered
- Engage in consumer research to understand the wants and needs of the new markets (medium term)
- Expand offer to next generation of meat eaters (young people in China/India)

- Invest in generating volume through new partnerships (i.e. the next McDonalds)
- Watch how innovation/regulation is playing out to cover self

Note: For a detailed look at potential actions by stakeholder (meat companies, farmers, government and B+LNZ, refer to the full report.



Case study: Undenially Dairy (the US dairy industry)—what they did to execute this type of strategic response

The dairy industry in the US is hitting back at declining sales by coming together with a coordinated response.

What they did:

1. Developed a coordinated communications campaign
2. Focusing on expansion—working with the US trade representative Robert Lighthizer to focus on markets such as Mexico
3. Looking at new markets—expanding its market reach to Asia remains a key priority for the US dairy sector. Exports to Southeast Asia rose 16% and sales to China were up 74% for the first quarter of 2017

What we can learn:

- This required a significant amount of investment in communication and brand positioning to try to influence consumer demand and push a new narrative around dairy
- Global expansion is essential to draw new consumers (and requires strong partnerships with government officials in both domestic and foreign governments)

We will continue to urge Lighthizer to focus on protecting Mexico, our number 1 market, and pursue additional export opportunities around the world.”

- Tom Vilsak, CEO US Dairy Sector



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