The Future of Aotearoa New Zealand's Food Sector

Exploring Demand Opportunities in the Year 2050

Public consultation on a draft long-term insights briefing
on future demand-side options for our food export markets

1 -24 February 2023

Ministry for Primary Industries
Manatū Ahu Matua

NOT GOVERNMENT POLICY

The future is bright for Aotearoa New Zealand. Our climate, natural resources, and ability to produce quality food products competitively and sustainably position us well to meet demand from an increasingly diverse range of consumers.

But, to capture these opportunities we will need to continue to make good choices.

Ministry for Primary Industries
Manatū Ahu Matua

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01

FOREWORD

Why are we interested in consumer demand for New Zealand’s food exports?

- 1.1 Introduction
- 1.2 Summary
- 1.3 Key Insights

1.1 INTRODUCTION

The future of food – from the end-consumer's perspective

Food is the foundation of Aotearoa New Zealand's export economy – totalling $42.3 billion in 2022.[1] It currently represents 62.8% of the $67.3 billion total export goods.[2]

A lot of effort is going into setting vision and strategy for the sector through programmes like 'Fit for a Better World', and a range of industry transformation plans to help meet the challenges ahead.

Te Puna Whakaaronui, the independent thought-leadership group established to support this transformation, notes that there are three key global drivers of change in our food export economy: climate change, technology, and consumer preferences.[3]

While New Zealand's response to climate and technological change is being tackled through a range of government programmes, less attention has been given to how changes in consumer preferences in the future might affect New Zealand's food export sector.

We are seeking your views on demand-side opportunities and options for New Zealand's future food exports. In this consultation document, we explore what consumer demand for food might look like in our export markets by 2050, and what opportunities this might present New Zealand going forward.

Share your insights – tell us what you think

1. Download a submission form and submit to ltib@mpi.govt.nz
2. Join one of our online info and chat sessions. To register email ltib@mpi.govt.nz with your preferred time:
    - 1.30 pm, 9 Feb 2023
    - 11.00 am, 17 Feb 2023
3. Request a 30-minute one-on-one meeting with us by emailing ltib@mpi.govt.nz

What is a Long-term insights briefing?

Long-term insights briefings help New Zealanders collectively think about and plan for the future. They explore long-term issues facing people in Aotearoa New Zealand. Briefings are a new requirement for agencies under the Public Sector Act 2020.

The briefings are independent of ministers and not government policy. The suggestions and insights included in this draft briefing are written to spark thinking, and ultimately action, by people across political spectrums, business, and communities, to ensure that New Zealand is prepared for change ahead.

How we developed this consultation document

The subject for our draft Briefing was consulted on from 22 August to 16 September 2022. Submitters supported an opportunities-focused exploration of the future consumer demand side of food and fibre exports, noting that most analysis to date has been on the supply side. See summary of submissions on the subject.

To focus the scope, we decided to limit our draft Briefing to consumer demand for food exports. We do not specifically look at fibre, but many of the insights are also relevant to this sector.

To develop the draft Briefing we explored the major trends and demographic changes that are likely to affect consumer demand out to 2050 and did an extensive literature review on likely future consumer demand for food. We also held internal workshops and interviewed 33 industry and wider sector leaders, and innovation ecosystem and industry bodies.

We would now love to hear your insights to help us finalise it.

1.2 SUMMARY

Consumers in current export food markets

New Zealand is a highly efficient exporter of primary food products. We mostly produce sought-after commodity products (e.g. dairy, meat and fruit) which are sold to other companies, but we also produce a complement of consumer-focused products.

Insights on 2050 food consumers

Demand for New Zealand's existing product mix will likely increase amidst growing global commodity demand arising from population and wealth growth and climate disruptions to worldwide food growing systems.

Consumer-driven opportunities

Looking at future consumer demand, there are many opportunities to diversify New Zealand's portfolio of food exports and markets and reduce capital, workforce capability, supply chain and environmental risks. Current work programmes could be leveraged to build knowledge and capability to pursue consumer driven opportunities and make connections with other sectors like health, education, tourism and innovation.

The global consumers of 2050…

Questions to ponder

Potential options to consider

…will have expanding core needs

Traditionally, core needs have centred on personal safety and satisfaction. In recent years, external concerns, such as sustainability, have become core. By 2050, animal and human welfare as well as food sovereignty also may become core needs.

New Zealand has built a reputation as a safe, and trusted provider of quality food that is the foundation of its trade. By 2050, this may not be enough on its own to differentiate ourselves with consumers.

Our future reputation: Is New Zealand's current value proposition likely to keep pace with changing consumer needs?

Options to consider: revising New Zealand's value proposition, developing improved, tech-led assurance systems for end consumers or planning response to reputational shocks.

…will have more diverse preferences

Global trends indicate more **demand for localised production**, **connecting food and health**, **technological change**, ongoing concern about **safety and security**, **environmental disruption**, **shifts in economic power** and **changing consumer-supplier relationships.**

Six possible consumer demand pathways are: 'Locavores', 'Direct-to-me', 'Experience seekers', 'Back to nature', 'Evolvers', and 'Individualists'. These already exist but are likely to accelerate driven by global trends and emerging consumer needs and aspirations.

Our future exports: What new information and capabilities are needed to encourage development of innovative products and services to customers and consumers in emerging export markets?

Options to consider: develop 'weightless' export markets, address IP issues around our technology and indigenous products, check New Zealand's stance on genetic modification, or build direct-to-consumer marketing capability.

…will increasingly live in Asia or Africa

While New Zealand's existing markets will remain wealthy, Asia and Africa will see major growth in population, economic activity, and individual wealth.

Consumers in the growing markets of 2050 may possibly be more aligned with the six demand pathways than consumers in New Zealand's traditional markets.

Our future markets: Is the balance right between our traditional markets and those in potential growth markets?

Options to consider: gather more granular information about consumers in growing markets and build mental and physical presence with their consumers.

1.3 KEY INSIGHTS

Consumer preferences are changing and new demand pathways are emerging to compete for hearts, minds, mouths and wallets.

- Demand for New Zealand's existing product mix is likely to increase amidst growing global commodity demand arising from population and wealth growth, and climate disruptions to worldwide food growing systems.
- In addition, there are viable options to further diversify New Zealand's export mix to better serve emerging end-consumer needs and aspirations.
- Diversifying our export mix and market coverage could increase the resilience of our food export industry, bolster reliability of returns, create higher paying specialist jobs, improve our environmental footprint, and help achieve our Fit for a Better World objectives.
- Opportunities are emerging now. There are long lead times to capture them. Many require more granular market information and collaborative ways of thinking and working to unlock their full value.
- **Is New Zealand well positioned to successfully navigate through this uncertainty? Which, if any, of the demand pathways we identify in this draft long-term insights briefing should we consider pursuing?**

Some questions to ponder during this consultation

Our future reputation: Is New Zealand's value proposition likely to keep pace with changing consumer needs? Options to consider are:

- Enhance New Zealand's long-term value proposition to include both current natural advantages and reflect changing consumer needs.
- Build advanced assurance systems that enable consumers and regulators to directly confirm that the food meets their needs.
- Plan to respond to shocks to our reputation with end-consumers.

Our future exports: What new information and capabilities are needed to encourage innovative products and services to customers and consumers in emerging export markets? Options to consider are:

- Support expansion of weightless exports.
- Address intellectual property (IP) issues particularly around indigenous species.
- Check our stance on genetic modification (GM).
- Build direct-to-consumer capabilities.

Our future markets: Is the balance right between our traditional markets and those in potential growth markets? Options to consider are:

- Develop marketing and cultural competencies in emerging markets.
- Build recognition of our value proposition in emerging markets.

To capture these opportunities, how can existing programmes be leveraged to:

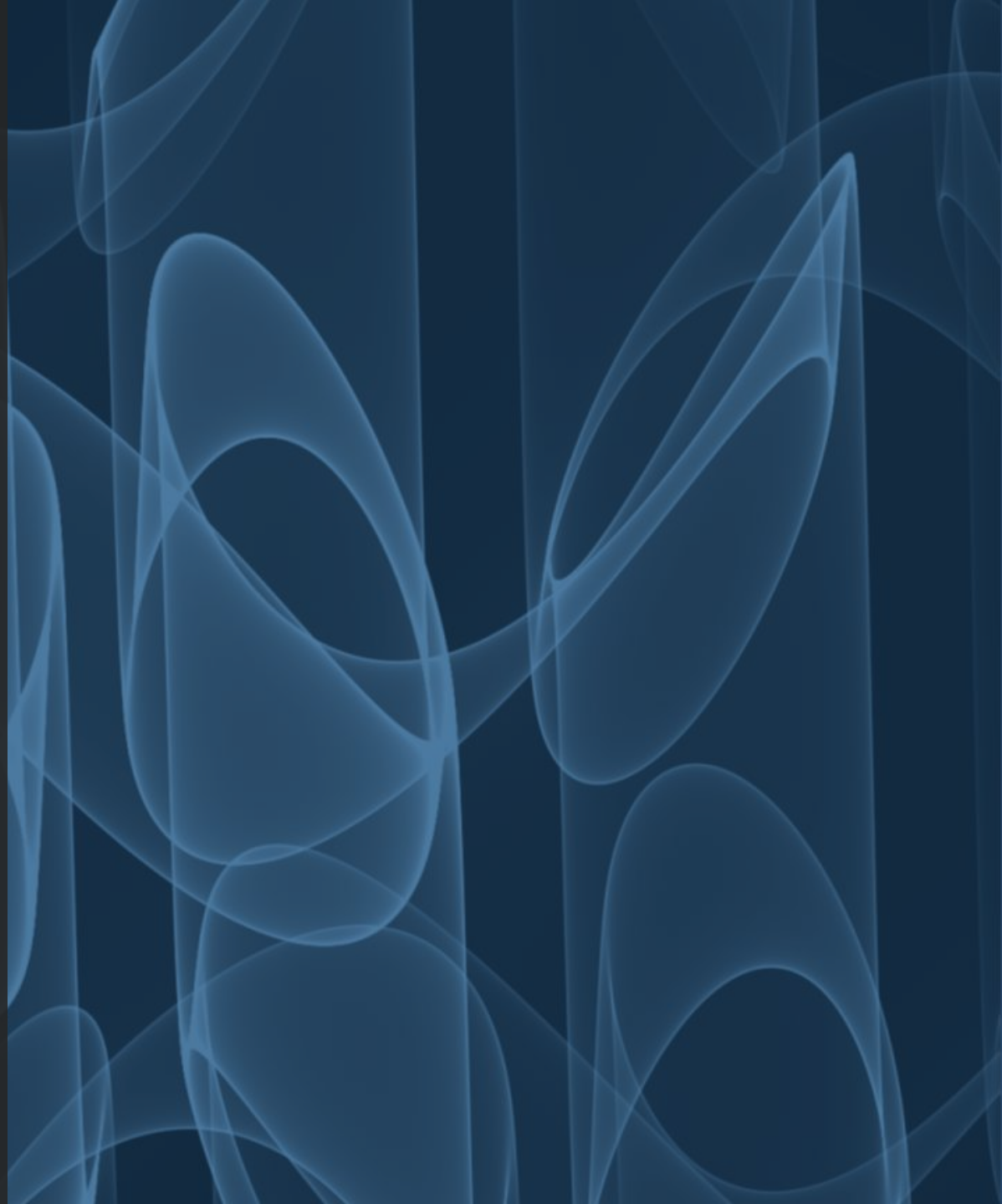
- Inspire and support our exporters to build knowledge and capability to pursue consumer demand opportunities?
- Make connections between the food sector and other sectors like health, education, tourism and innovation?

02

CONTEXT

What is influencing consumer demand for food?

- 2.1 Our export markets
- 2.2 Who are the consumers of 2050?
- 2.3 Changing consumer preferences
- 2.4 Current industry perspectives



A complex range of factors will influence consumer demand for food by 2050

Consumer demand for food has driven food production for centuries. Early demand was constrained by available local supply and major events that affected access to food, like famines and new discoveries. This changed after the industrial revolution when long-distance trade removed a lot of the potential for food shocks and enabled consumers to experience more consistency and variety. In Aotearoa New Zealand, Māori traders were some of the first to tap into the resulting acceleration in consumer demand. By the mid-1900s, consumerism fuelled global trade, supported by increased safety, biosecurity and quality systems and free trade agreements.

Today, Aotearoa New Zealand has made its mark as a safe and reliable food exporter, initially through strong relationships with our traditional markets and more recently with China and other Asian markets.

The future success of our food sector will depend on a good understanding of how end-consumer preferences are likely to change. In this section, we look forward to the factors that might be influencing end-consumers by 2050. We look at the direction of New Zealand's current markets, key worldwide demographic changes, the major global trends influencing consumer preferences and what food sector leaders think is likely to drive future consumer demand.

This information will help us to identify whether and where to expect changes to consumer preferences and what this might mean for our future food exports.

2.1 OUR EXPORT MARKETS

How are we positioning ourselves now and what changes might we see by 2050?

2.2 WHO ARE THE CONSUMERS OF 2050?

A brief scan of the major demographic shifts that might influence end-consumer demand.

2.3 CHANGING CONSUMER PREFERENCES

The global trends that are most likely to affect end-consumer preferences in the longer term.

2.4 CURRENT INDUSTRY PERSPECTIVES

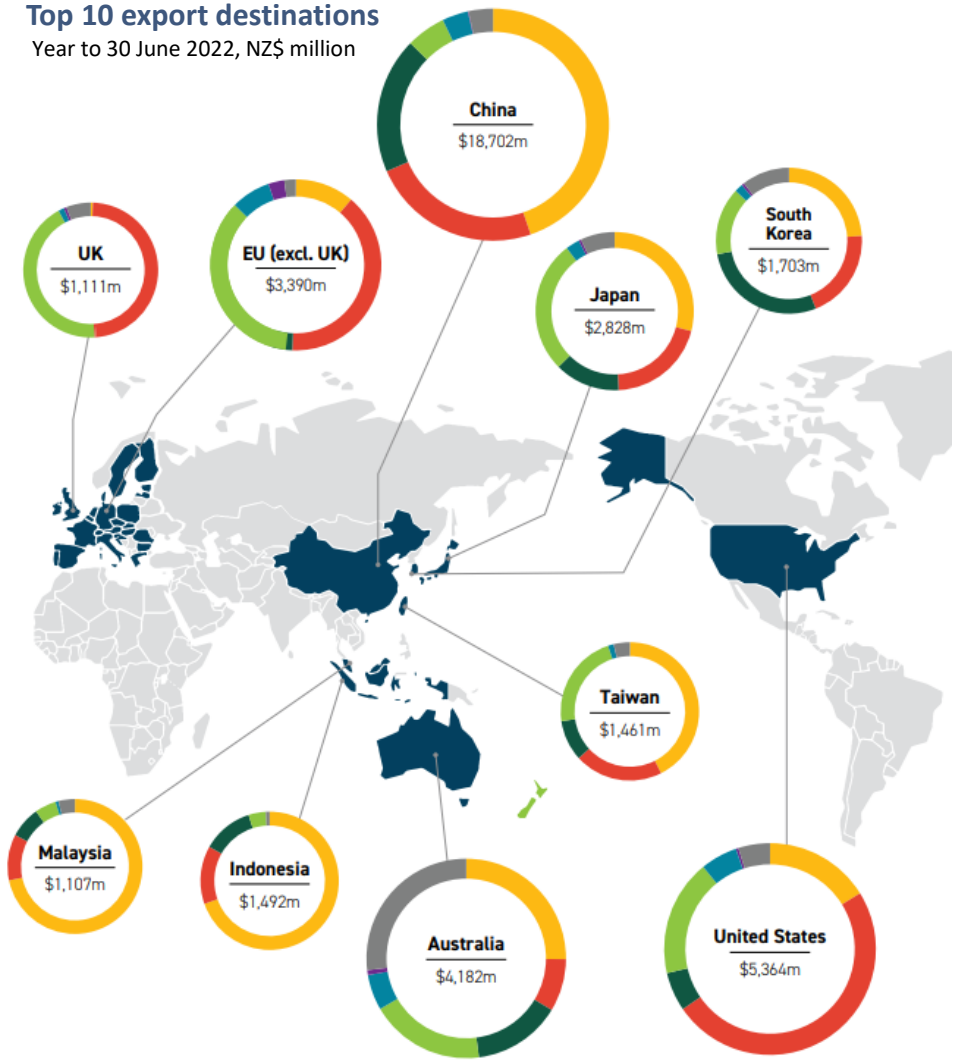
We talked to business leaders to find out what they think is influencing end-consumer demand.

2.1 OUR EXPORT MIX

Most of our primary sector exports are sold to major customers (companies who produce value-added consumer-facing products), rather than to consumers via New Zealand-owned brands. There is far more demand than we can satisfy.

Top 10 export destinations

Year to 30 June 2022, NZ$ million



Source: Ministry for Primary Industries (MPI) Economic Intelligence Unit, 2022.[4]

Dairy is New Zealand's largest export. Since cheese was exported in 1846, the sector has grown to a world-leading processor of sophisticated powders and processed dairy products. Global dairy demand is forecast to remain strong.

Horticultural crops remain on a growth pathway with a more diverse set of export markets than other food exports. They are mostly exported as primary products, such as apples and pears, kiwifruit, wine and vegetables.

Processed and other foods consist of a diverse range of goods including honey, and innovative processed foods.

Meat products such as sheep, beef, and venison are mostly exported as bulk commodity goods to consumer-facing companies, such as fast-food restaurants. Pork, poultry, and other meats serve mainly domestic demand. Demand is expected to remain firm.

Seafood is exported as bulk commodities and consumer-facing products. Most seafood is harvested in the wild, (e.g, hoki, tuna, snapper), but salmon, mussels, and oysters are farmed but in smaller quantities. Demand remains stable.

Māori food exports make a significant contribution to the economy. Thirty-two percent of all Māori businesses operate in the food and fibre sector, which are particularly focused on the seafood, meat, and forestry sectors. Although most Māori food businesses are small, 38 percent of are medium or large. Combined agriculture, forestry and fishery assets have increased 108 percent since 2018.

The sector accounted for 1.4 percent of New Zealand's food exports ($750 million) in 2021.[5]

Export categories

Product	Export revenue (NZ$ million)	% of total
Dairy	21,998	41%
Meat and wool	12,310	23%
Forestry	6,578	12%
Horticulture	6,782	13%
Seafood	1,919	4%
Arable	252	1%
Processed food and other products	3,226	6%
Total	53,065	100%

Year to 30 June 2022, NZ$ million: NB – wool and forestry are not included in our analysis of the future of food exports

2.1 OUR EXPORT MIX

Demand for our existing food export products is likely to increase with growing worldwide demand for food. Our production resilience to climate shocks is relatively better than other food producing countries. This puts us in an excellent position as we plan for the future.

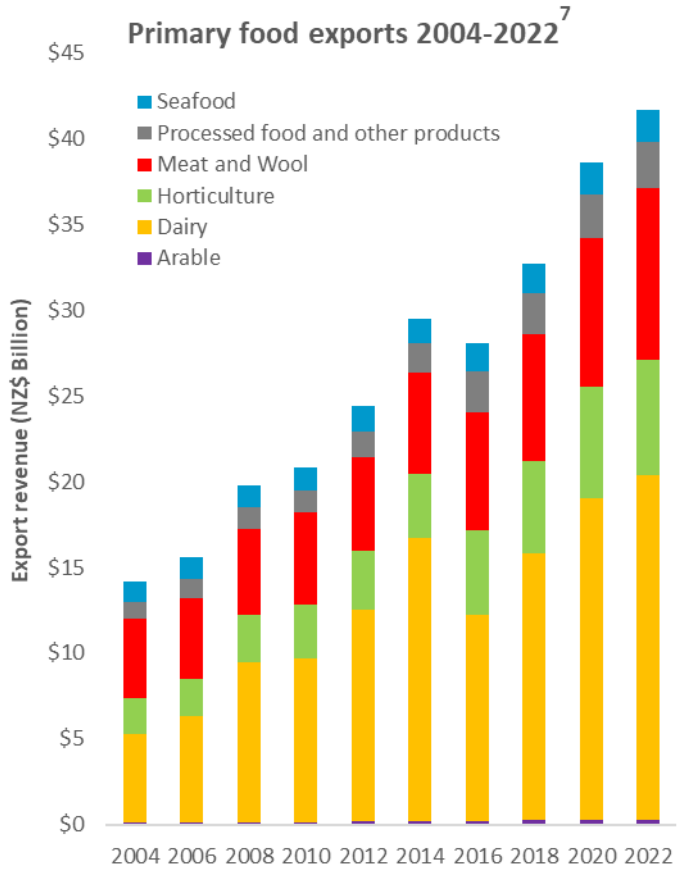
Our ongoing comparative advantage

Our existing markets are in a good position. New Zealand food producers have become extremely efficient, garnering a reputation as a safe, quality food provider. Work is underway to reinforce our claims of being a natural and sustainable producer.

A test of our resilience has been the COVID-19 pandemic and its aftermath, including supply chain issues. The sector has seen record revenues during COVID-19 recovery.

Looking out to 2050, a study by the Agribusiness and Economics Research Unit (AERU)[6] indicated that while there may be shocks to different parts of the food sector and different regions, overall, more frequent climate events are unlikely to cause major overall impact on our food export revenues. Looking at New Zealand climate scenarios alone, climate events may result in a 7-9 percent reduction in cereal revenue, 5 percent in wine and 2 percent in sheep and beef meat. Dairy revenues are not significantly impacted.

However, if there are also frequent and widespread events worldwide, New Zealand food export revenues are likely to increase overall, as they benefit from higher prices resulting from global reduction in supply.



Demand for our existing product mix is increasing, particularly for dairy and meat.

Why should we be thinking about end-consumer demand 30 years from now?

We still need to plan ahead to capture additional opportunities to protect ourselves from future shocks to our food export markets, and to improve our productivity, economy, environment and society further as we transition to the world of 2050.

Looking at end-consumer demand is one lens we can use to assess future possibilities.

- In the short-term, understanding end-consumer needs will help differentiate us to our current customers.
- In the long-term, it opens the door to more direct-to-consumer possibilities.
- We also need to know if future changes in consumer demand could impact demand for New Zealand food.

Other food producing countries are not likely to remain static as they face more frequent health and climate events and geo-political shocks. They too will look to adapt and develop markets to build in better resilience, develop alternative products and diversify to new products and services. Keeping one step ahead by building our own resilience and a portfolio of options will be key.

2.2 WHO ARE THE CONSUMERS OF 2050?

Demographic data on the consumers of 2050 shows that major shifts around aging, urbanisation, wealth and distribution of the population are likely to see consumer preferences change and new opportunities emerge.

More, more, more

Consumers will need 56 percent more food by 2050.[9] They are living longer, more are better educated, and the shift to living in cities will continue. However, the equity gap between rich and poor persists with continuing rising wealth inequity and political unrest for more than 70 percent of the world's population.[8]

8 billion people now, 9.7 billion by 2050.[9]	Between 2015 and 2050, the proportion of the world's population over 60 years old will nearly double from 12 percent to 22 percent.[12]
68 percent urban by 2050 with 66 mega cities.[10] Most rapid in Asia and Africa.	But the Philippines, India, Egypt & Pakistan remain 'young' into 2050.[13]
Cross-country inequities in education are closing.[11]	

EXPECT: increasing demand for food, especially for health-based food products for an aging population, and demand for alternative options to meat and dairy as production reaches limits

Swing to Asia & Africa

The significant demographic shift to Asia and Africa will continue, with rising population and incomes, as population rates in the west slow. Almost 3 billion, or more than 40 percent of today's population, will join the middle classes by 2050. These entrants will be almost exclusively from today's emerging markets.[14]

More than half of projected population growth to 2050 in 8 countries in Asia and Africa.[9]	6 million people in New Zealand by 2050; 26 percent Asian, 20 percent Māori,10 percent Pacific. European down from 70 percent to 64 percent.[17]
The west stays wealthy but population growth rates slow with less than 2 percent consumption growth.[15]	The east is growing. China, India, the Philippines and Malaysia annual growth in real incomes is more than 4 percent.[15]
India's population to overtake China in 2023.[16]	

EXPECT: significantly increased demand from Asia and Africa, demand for increased diversity in food options and higher expenditure per capita from these countries.

Today's youth are tomorrow's target

The youth of today will be 2050's largest consumer group.[18] This includes the generation born in the next few years. Their consumer needs and wants will be underwritten by a significant wealth transfer from older generations. In the United States alone, this equates to US$72 trillion by 2045.[19]

Environmental sustainability is seen as the greatest issue for young people, but this does not factor significantly in today's young consumer food purchasing decisions yet.[18]	
The working age population will decrease 10 percent worldwide by 2060 – but will be uneven worldwide.[20]	Today's young people value food as medicine for physical and mental health.
Primarily indulgence led[21] – value, taste and health remain as key consumer considerations in food and beverages.	

EXPECT: increasing demand for sustainable and ethical food that addresses physical and mental health as well as ongoing demand for value, quality and taste.

2.3 CHANGING CONSUMER PREFERENCES

The global drivers below are likely to influence end-consumer food choices by 2050.

PREFERENCE FOR LOCALISED PRODUCTION

- **Increasing trade barriers**: Pressure on free trade due to sustainability, localisation of food supply and food safety.
- **Governments focus on domestic resilience:** Supply chains and stockpiling or banning exports in response to acute shocks.
- **Rise of food sovereignty:** Growth in demand for rights of people to produce their own food follows concerns about the centralisation of the food system.

Expect: Increasing demand for locally-produced food.

SHIFTING CONSUMER-SUPPLIER RELATIONSHIPS

- **Direct to consumer:** Subscription/gifting models, influencer driven.
- **AI/internet of things:** Bots (artificial intelligence) do the buying.
- **Shift to private power:** 20 companies now process most of the world's food.[22]
- **Dissolving borders:** Technologies enable decentralisation and cross-border societies. Power defined by control of flows of people, goods, money and data.[23]

Expect: More demand for direct-to-consumer services.

TECHNOLOGY CHANGE

- **Growth in demand for alternative foods**: Plant-based and other alternative proteins, insect agriculture, algal products.
- **Wider technologies**: Artificial intelligence (AI), internet of things, big data, virtual reality (VR), digitisation, blockchain, smart/remote farming.
- **Biotechnology accelerates:** Cellular agriculture, genomics, genetic modification, microbiome research, synthetic biology and alternative proteins – and is increasingly accepted.[24]

Expect: Increasing acceptance of new technologies.

SHIFTS IN ECONOMIC POWER

- **Emerging markets**: Emerging market consumption could be two-thirds of global consumption in 2050, compared to around one-third today.[25]
- **Surge in electoral autocracies**: The share of global output coming from economies classed as 'mostly unfree' (economies with a high degree of state ownership and control) is set to rise from 12 percent to 43 percent, based on Bloomberg Economics' gross domestic product (GDP) forecasts and the United States (US) Heritage Foundation's classification system.[26]

Expect: Increased demand from non-traditional markets with more state-based influence.

ENVIRONMENTAL DISRUPTION

- **Environmental impact of food production:** Impact per unit of production increases from 50 percent in 2010 to 90 percent in 2050.[27]
- **Climate impacts on food production**: About 80 percent of the global population most at risk from crop failures are in Sub-Saharan Africa, South and Southeast Asia.[28]
- **Global food waste grows:** More than one third of global food production (1.3 billion tonnes) is wasted annually. Global waste is likely to grow by 70 percent by 2050.[23]
- **Rise of regenerative agriculture practices.**
- **'Flexitarianism':** Meat intake reduces, replaced by alternative proteins.
- **Rise of the circular, green economy.**[30]

Expect: The rise of 'conscious consumerism'.

CONCERN ABOUT FOOD SAFETY AND BIOSECURITY

- **Antimicrobial resistance** increasing.[31]
- **Exposure to new human and animal diseases:** Risks grow with increased mobility of people and goods, climate change, and crossover between species.[32]
- **Illegal acts**: Food fraud, contamination and sabotage may become a significant challenge.

Expect: Growing demand for assurance.

OVERLAPS BETWEEN FOOD AND HEALTH

- **Aging populations:** More people begin focusing on ways to improve overall health as they age.
- **Precision technologies develop**: These enable individually targeted nutrition.
- **Shift in health systems:** Moves from treating disease to prevention.

Expect: Increasing interest in individualised solutions to health and nutritional requirements.

2.4 INDUSTRY PERSPECTIVES

We met with 33 food and fibre industry and innovation system leaders seeking their perspectives on future consumer demand. They are already identifying shifts in consumer demand and are generally seeing the trends playing out in the following ways:

CORE CONSUMER NEEDS – Consumer behaviours that do not seem to have changed, and are ongoing.	
Quality, taste	These core elements are likely to stay as key drivers of consumer demand.
Affordability	A significant trade-off for many consumers when deciding which product to buy.
Convenience	Food that is in appropriate formats and is suitable for consumers' individual lifestyles.
Trustworthiness	There is an expectation that industry will need to work on mechanisms to increase consumer trust in its products – sustainability, ethics, quality, origin and safety. This is also seen as a likely cost of entry.

CHANGING CONSUMER PREFERENCES – Changes in consumers that industry is noticing.	
Sustainability	Environmental impacts of food production are not well understood by consumers. Only a niche group is willing to pay a premium for sustainability claims. Many sector leaders see this as a cost of entry, not a point of difference.
Ethical production	While some consumers will pay a premium for more ethically friendly production, it is currently a niche segment that is expected to grow. This includes factors like labour practices and animal welfare.
Localisation	A noticeable trend towards buying products grown or produced locally. The three drivers of this are supply chain/food security post-COVID, perceived lower emissions footprint and local producers lifting their performance.
Growing focus on health and nutrition	Food as a medicine, especially with an aging population is becoming a significant area of development.
Demand for plant based protein	Some consumers are switching to plant based proteins, or reducing their animal based protein intake to become 'flexitarian'. However, industry leaders still think that global animal protein demand will continue to grow.
More than just nutrition	Consumers are seeking out experiences with their food that are tailored to specific occasions and individual lifestyles.

Our existing export food markets are in a very good position going forward. New Zealand should benefit from growing demand and higher prices that may arise from climate disruption and an increasing world population.

But, global trends and major demographic shifts are likely to shift core consumer needs and create greater diversity in individual consumer preferences by 2050.

In the next section we explore how these drivers and trends might influence consumer demand and what this might mean for our future food exports.

03

CONSUMER DEMAND

What will consumers want by 2050?

- 3.1 Core consumer needs
- 3.2 Six demand pathways
- 3.3 Shifting markets

What will consumers want by 2050?

In this section, we delve into what consumer demand might look like in 2050, based on the drivers and trends we highlighted in Part 02. We examine this from three angles; changes to core needs, possible future consumer demand segments, and changes based on the highest growth markets.

EXPANDING CORE NEEDS
Industry leaders told us that they think the core consumer demands of today will remain fundamental drivers, but they are increasingly seeing sustainability and wider ethical concerns as costs of entry. We examine these ideas further.

MORE DIVERSE PREFERENCES
Based on the global trends, and our discussions with sector leaders, we identified six possible future consumer demand pathways. We delve into the opportunities that these might present going forward.

SHIFT TO ASIA AND AFRICA
Our demographic analysis showed that there will be a significant demographic shift to Asia and Africa by 2050. We explore what this might mean for future end-consumer demand.

Probable

Possible

Possible

3.1 CORE CONSUMER NEEDS

Fundamental preferences.

We look at: food security and safety, taste, price, convenience, quality, sustainability, ethics and food sovereignty.

3.2 SIX DEMAND PATHWAYS

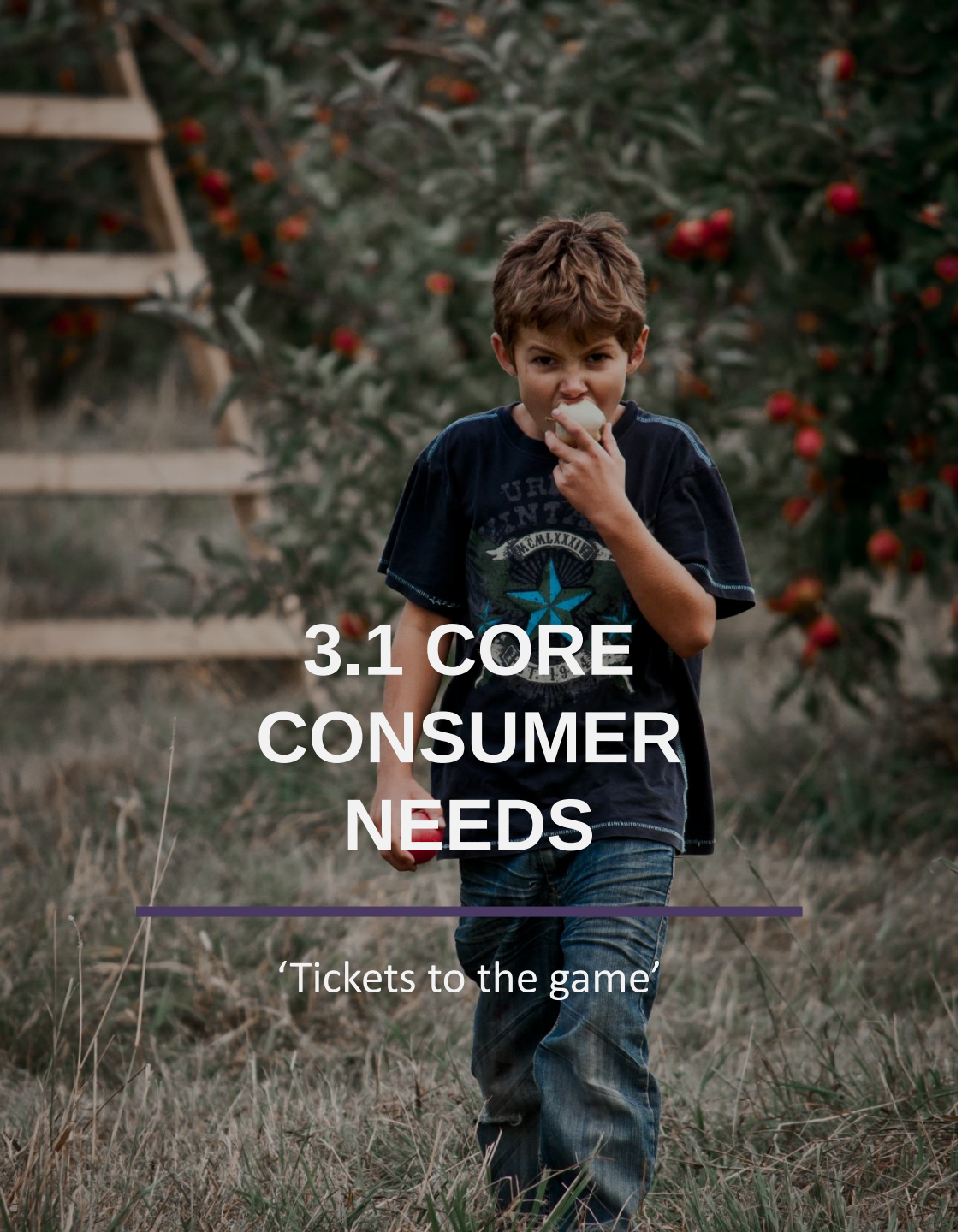
Six possible future scenarios for individual consumer demand: 'Locavores', 'Direct-to-me' 'Experience seekers', 'Back to nature', 'Evolvers', and 'Individualists'.

These are driven by: localisation, changing consumer-supplier relationships, 'more than nutrition', environmental disruption, technology change, and food & health.

3.3 SHIFTING MARKETS

Where our future consumers may come from

A brief discussion on the changing markets of 2050 and which markets are most aligned to our consumer demand pathways.



3.1 CORE CONSUMER NEEDS

‘Tickets to the game’

Core consumer needs are non-negotiable ‘tickets to the game’. If these are not served, consumers are unlikely to be receptive to our products, much less likely to pay a premium, and we risk higher barriers to entry for our food.

In this next section we explore how these fundamental consumer needs may change over time, and what this could mean for our future export markets.

3.1 CORE NEEDS: 'TICKETS TO THE GAME'

The core needs of today's consumers are still likely to be relevant in 2050.

The fundamental needs of consumers with a with a reasonable level of disposable income are unlikely to change - food safety and affordability, taste, price, quality, and convenience.

New Zealand currently trades on its excellent reputation in these areas, particularly around food safety, taste and quality, but an understanding of the changes in these core needs will help us keep ahead of our competitors.

For consumers with low incomes, food security and affordability are likely to remain a core need, despite efforts to address these issues.

Food Security

- The world will need 56 percent more food by 2050.[33]
- Currently, 3.1 billion people cannot afford the least-cost form of a healthy diet. The majority live in Southern Asia (1.3 billion), sub-Saharan Africa (894 million) and Southeast Asia (347 million).[34]
- Rising wealth inequality for over 70 percent of people and 840 million food insecure in 2050.[35]
- By 2050, 216 million people may need to move within their own countries due to climate change.[36]
- Natural disasters, disease, and pathogen issues could worsen hunger reduction outcomes.
- Food security may influence future decisions about what sector of the consumer market should be targeted (e.g. high value vs commodity).

Food Safety

- Currently, 10 percent of people worldwide fall ill from contaminated food each year.[39]
- Food safety will be seen as a holistic issue – including climate change, ethics and security.
- Gene technologies have not been shown to introduce any new or altered hazards into the food supply to date.[40]
- Food fraud is becoming an increasing concern for consumers. Major food safety incidents are likely to occur that affect national reputations.
- New food safety perceptions may emerge from shifts in food sources and production, technology and climate change.

Taste

- A key consideration for most people is the sensory perception of food, which includes taste, smell, texture, and appearance.[43]
- The sensory profile for foods and drinks is expected to continually improve and evolve. For instance, the use of flavour sensors and artificial intelligence will help to develop tastier and more customised products.[44]
- By 2050, taste will remain a key driver – as consumers revisit flavours of the past, but also try new tastes.
- More diverse cultural preferences (e.g. Halal) may drive consumer tastes.

Price

- Price elasticity of high-income consumers is much lower than for low-income consumers – i.e. the cost of food is not as much of a factor for higher income consumers.[37]
- This may mean that affordability as a barrier may decrease for many consumers. The increase in disposable income in some emerging economies will result in an increase in food consumption, but also a composition change, with greater demand for important nutrients such as protein.[38]
- However, food affordability is still likely to be a driver for lower income consumers worldwide with a significant proportion of people still expected to be affected by food security issues particularly in areas where there is conflict, climate extremes or inequality.

Quality

- The top 5 factors that influence consumers' perception of food quality (in order of importance) are; appearance (includes shape, size and colour), price, ingredients, origin (country), and taste.[41]
- Food quality is likely to continue to improve for consumers due to advancements in supply-chain technology. Packhouse to consumer timeframes are expected to decrease dramatically.
- The potential effects on food quality from climate change are increasingly being addressed by technological advancements.[42]

Convenience

- Convenience often trumps nutrition, with people choosing time and effort saving convenience foods such as pre-packaged snacks, fast food, frozen meals, and take-out. This is particularly prevalent in the West but also growing in markets such as Asia where 'lazy meal' sales are on the rise.[45]
- Convenience has been a major element in consumer decisions especially since COVID-19 – however it is moving from 'speed' to 'empowerment of consumers' to easily create meals.[46]
- There is a perception that ready meals are lacking in terms of taste, quality, and nutrition. New cooking devices, powered by AI or using 3D printing technology, and meal kits have the potential to close the gap and deliver a high-quality, convenient eating experience.

3.1 CORE NEEDS: 'TICKETS TO THE GAME'

Traditionally, consumer core needs have focused on personal safety and satisfaction. In recent years, external factors, such as sustainability, are becoming core consumer needs.

Our discussions with business leaders indicate that many now consider sustainability to be a cost of entry. Products manufactured 'sustainably' seldom attract a premium unless combined with other desirable attributes.

Research indicates that while consumers are highly concerned about sustainability, this has not yet translated to consumer food purchasing decisions at the supermarket shelf. Consumers expect that the driving force for incorporating sustainable practices into food production will come from retailers and governments.[47]

By 2050, we expect ethically produced food to be added to the list of core consumer demands. This means that considerations around animal and human welfare in food production may feature alongside environmental concerns by most consumers who can afford to make choices.

Business leaders say that they are already seeing this emerge in our current markets. Regulators in these export countries are imposing requirements that they consider reflect their consumer needs. While there may be a lag in emerging markets, we assume that by 2050 these expanded needs could also be included as core.

There is also a possibility that as challenges relating to access to food increase with growing climate impacts, geopolitical events and concerns about corporate control of food, food sovereignty (rights of people to local control of their food) may also be included in ethical food purchasing choices by consumers.

Sustainability	Ethics	Food Sovereignty
• Investors, boards, customers and Governments are increasingly demanding environmental sustainability as part of a licence to operate.[48, 49] • While 80 percent of consumers are concerned about sustainability, only 1-7 percent currently pay a premium for sustainable purchases.[50] • Carbon border taxes may be applied internationally – the EU and US are already proposing tariffs around foreign goods not subject to carbon pricing in their home countries.[51] • Increasingly, the focus is moving to 'Scope 3 emissions' - those emissions which are the result of activities from assets that the organisation indirectly affects in its value chain.[48, 52] • The concept of sustainability may broaden by 2050 and include greater emphasis on issues such as water use.[48, 53] • Possible need to balance emissions reductions with increasing demand for food. In addition, some consumers and markets may not be able afford sustainability.	• While most consumers do not currently consider ethical matters when choosing food, this is likely to change. Already 46 percent of Gen Zs and Millennials in senior roles in business have rejected an assignment based on their personal ethics.[54] • Demand for ethical food production is likely to grow, including in environmental practices, working conditions and wages, cultural practices and animal welfare. • There is likely to be special focus on animal protein production but ethical choices are likely to extend to all food products. • The increase in alternatives to animal proteins, e.g. plant-based meat and technologically driven alternatives, is likely to provide more choices.	• Food Sovereignty is a movement that supports the rights of communities to define their own food, agriculture, livestock, and fisheries systems. • Greater awareness of food sovereignty issues by consumers is expected as indigenous populations rise and transparency around food sources increases.[55] • Rising concern about corporate control of seed, food production and distribution may accelerate food sovereignty as a major issue by 2050. • Uptake of international architecture around indigenous rights. E.g. Indigenous Peoples Economic and Trade Cooperation Arrangement, United Nations Declaration on the Rights of Indigenous Peoples and indigenous chapters in FTAs including New Zealand's FTA with the EU which has a 'Māori Trade and Cooperation' chapter to advance Māori economic aspirations.

3.1 CORE NEEDS: OPPORTUNITES

We need to maintain our reputation as a safe and reliable food provider, and keep up with growing consumer demands for sustainable, ethical production and more. Our existing markets already want more. By 2050, the consumers of emerging markets may want more.

OUR FUTURE REPUTATION

Is New Zealand's current value proposition likely to keep pace with changing consumer needs?

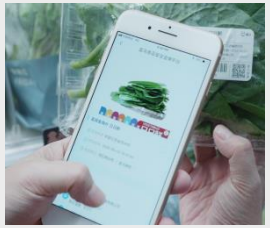
Should it include not only natural and cultural advantages but also wider ethical and other matters that resonate with the 2050 consumer?

If so, there are some questions that Government and the sector may need to partner together to find answers to.

This shift would need to be at a pace that allows us to stay one step ahead of our competitors, but still minimise increasing costs of entry that could have flow on implications for food affordability, food security, and economy.

Should New Zealand's brand be advanced to 'sustainability-plus'?

New Zealand can lean on its reputation as a sustainable food producer. However, industry leaders emphasise that sustainability is now a cost of doing business with little financial premium. As consumers of 2050 are likely to demand more than just environmental sustainability, we may need to consider if New Zealand should develop a wider scope 'sustainability-plus' brand that aligns with future consumer preferences.

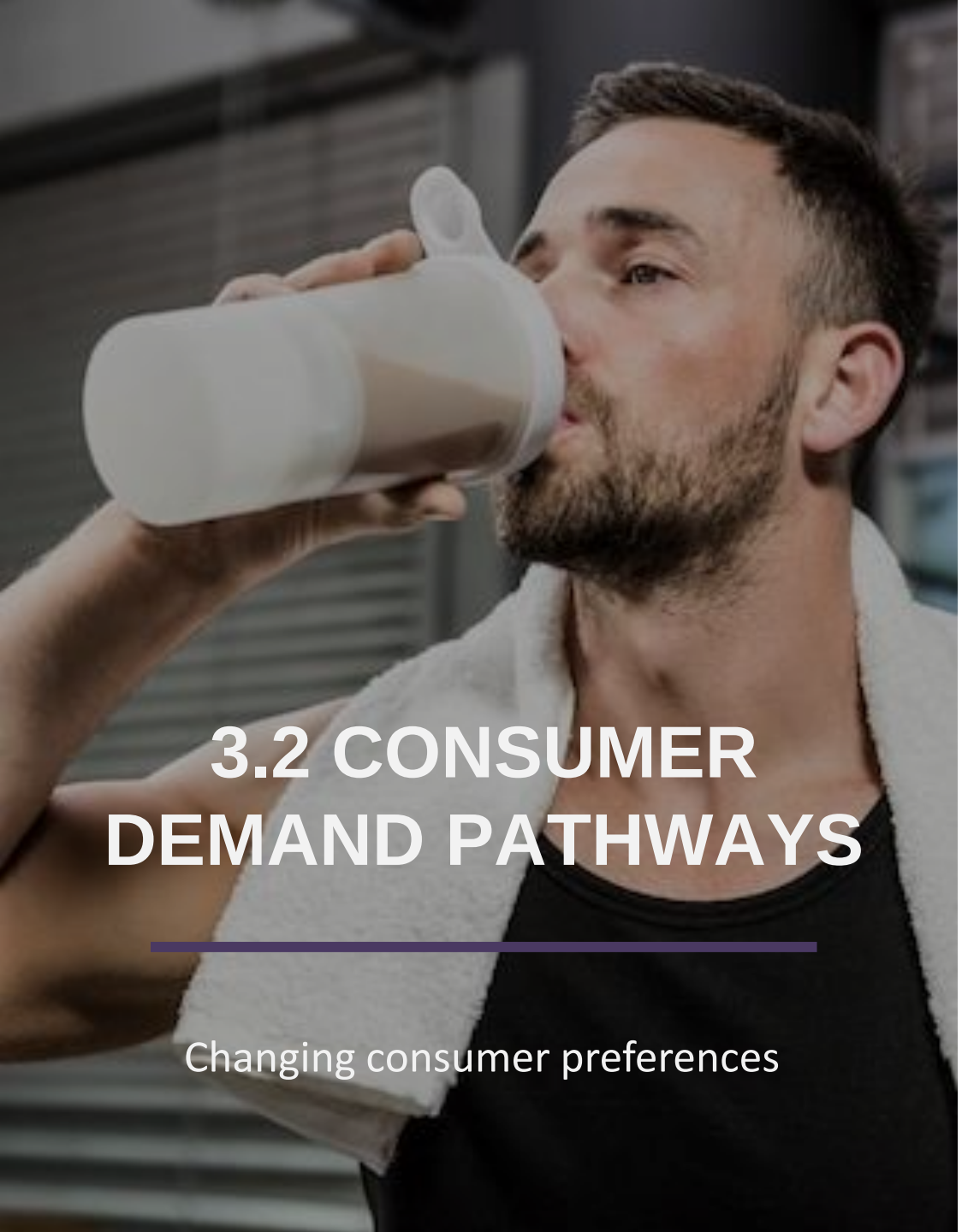


How should trust be built with end-consumers?

Risks of food fraud and sabotage to 'value add' products are increasing, which heightens the need to build and maintain trust with end-consumers. While our current regulatory system is good at this, more sophisticated and tech-enabled traceability and certification systems could be developed that allow end-consumers to directly verify claims. This will allow us to better meet consumers' core needs of safety, quality, and sustainability, as well as future core needs around ethical production, food sovereignty, and connections with the origin stories of food.

How should shocks to reputation with consumers be managed?

One of the most significant risks to New Zealand's reputation as a trusted provider of food is potential shocks impacting our ability to provide for core consumer needs. This includes geopolitical, climate, disasters, and biosecurity events affecting food supply, safety and security and regulatory failures. Planning early to respond to risks to our reputation is needed to maintain future resilience – including understanding and planning for end-consumer reactions.



3.2 CONSUMER DEMAND PATHWAYS

Changing consumer preferences

How might individual consumer preferences change by 2050 and what might this mean for our future export markets?

This section explores six possible consumer demand pathways. These are consumer-driven market segments that could emerge by 2050 or earlier. We delve into each one to find out what future opportunities might exist for Aotearoa New Zealand by 2050.

The pathways reflect a wide range of changing consumer preferences and are not mutually exclusive, they overlap with each other and other sectors like health or tourism. Some raise questions that we may need to think about at a national level. Others pose possible challenges to New Zealand's existing exports, but could also lead us to new opportunities.

3.2 SIX POSSIBLE CONSUMER DEMAND PATHWAYS

Introducing the possible future consumers of 2050. Here are their stories.

Our 'target' demographic was the high-growth middle class consumers who are financially able to pursue individual preferences.

These stories represent six consumer demand profiles that we selected from a long-list of scenarios generated in internal workshops. They describe the pathways that are most likely to occur because they:

- were each driven by more than one of the major global trends we described in Part 01.
- reflect demographic changes particularly around aging, urbanisation and behaviours we are seeing in rangatahi – the consumers of tomorrow.
- are emerging consumer behaviours being seen by sector leaders.
- reflect the shifts in core consumer needs that are likely to occur by 2050.

Other 'darker' scenarios may exist where global drivers like geo-political unrest, fragmentation of the global market system or massive climate disruption drive consumers to be focussed primarily on more existential concerns like food security and equity. We have not included those here, although our pathways do incorporate these major uncertainties as drivers.

THE LOCAVORE

Prefers products produced locally.

Aarin lives in a large city. She buys a lot of her food harvested from the local food towers installed after the food crisis of 2043 caused widespread issues accessing food for the population. The towers were installed by the government using low emission technologies from Aotearoa. She now prefers to buy most of what she eats from local suppliers – including some alternative foods manufactured in the city, replacing staples that would normally have come from other countries.

DIRECT TO ME

Sources food directly.

A few years ago, Indra starting using the New Zealand open-source food platform taking the world by storm that allows people to safely source food directly from producers anywhere in the world. The company has really shaken up the worldwide food supply system. She is planning to buy one of the new home kitchen food printers so she can print most of her basic staples using the quality New Zealand protein bases.

THE EXPERIENCE SEEKER

Not just food, but experience.

When not travelling the world trying out all the different cuisines, Fenhua is in the virtual reality world at home trying out their next cultural food experience with the friends they have made from their adventures. These days it is much more fun with some of new sensory add-ons. They can't wait for their next VR visit – to Aotearoa New Zealand. They have heard great things about the extreme food experiences there.

BACK TO NATURE

Sustainability and ethical choices are non-negotiable.

Ever since they were young, Lucia has been careful that what they eat is sustainably and ethically produced. Nowadays, it is much easier because the new tracing apps allows them to instantly see where their food has come from and its ethics score. Lately, they have been buying from the Aotearoa companies with the full traceability systems so they know that the food comes from indigenous or local farmers.

THE EVOLVER

Open to novel foods including GM and alternative proteins.

Larissa loves eating fresh food and has been purchasing gene edited fruit and vegetables from her local supermarket. After climate events and pest outbreaks led to a large amount of food waste and a higher grocery bill, she sees this as a more sustainable and affordable option. She enjoys experimenting with a range of other novel foods, including the new alternative proteins and indigenous food from Aotearoa.

THE INDIVIDUALIST

Seeks food tailored to their microbiome, DNA and goals.

Lingun's grandmother always taught him the importance of balance in diet as the key to good health. Now that he is getting older, he has installed the latest New Zealand developed AI system into his home that analyses his gut biome and waste, designs recipes and purchases the food he needs week by week. The technology is making a real difference to his health – his diabetes is no longer an issue.

LOCAVORES

Popularised in 2005, the 'Locavore' movement encourages the consumption of products produced locally. Locavores in 2050 will prioritise locally produced products bought directly from suppliers within the local community. While the concept of self-sufficiency and subsistence agriculture has been the dominant form of production in the world until the 20th century, the evolution of this trend will likely be empowered by new technology and products that enable local food production at scale and acceptable cost.

65%
of consumers in 36 countries try to buy local where possible.[56]

59%
of consumers believe that the farther food travels, the worse it is for the environment.[57]

Driven by:

Consumer demand for transparency: Increasing interest in food origins and food chain transparency to support ethical consumption.

Increased urbanisation: The significant urbanisation and growth of the middle classes may put pressure on supply systems to feed growing cities. Supply chain disruptions, compounded by the COVID-19 pandemic, reminded consumers that local suppliers may be more reliable.

Environmental impact of transportation: Growing concerns about the environmental impacts of transportation. In the United States food system, direct to consumer and intermediated chain can reduce food miles by ~90 percent compared to mainstream.[58]

Food sovereignty/resilience: Food self sufficiency has been highlighted as a national priority for many countries.

Economic: Increased interest in local community economic benefits, e.g. a study showed shifting 20 percent of food spending to locally produced in the city of Detroit would create 4,700 jobs locally.[59]

Implications for New Zealand

Risks and barriers

- New Zealand's distance to many of its markets.
- Reduction in demand for New Zealand export products.
- New Zealand consumers have decreased access to imported food items, reducing the variety of food available in New Zealand.
- Local production may result in lower production volumes, higher food prices globally, and higher emissions.
- Techniques like vertical farming, often require large energy inputs.

Opportunities

- Emphasise low-emissions production to overcome food-miles emissions concerns.
- Development of products and intellectual property around local production technologies.
- Invest in offshore food production/processing facilities to serve export markets locally.
- Innovation in product development using ingredients that cannot be produced locally in export markets, like indigenous products.
- Develop technology that enhances traceability of product to connect consumers to producers.
- Develop or deploy solutions to reduce energy and transportation costs of food production.
- Offer truly differentiated products to overcome the 'local only' bias.

Enablers: Advances in technology are making it easier for individuals to know more about product provenance, grow their own food easily and access food produced at a local level.

Aquaponic Farming
Suitable for urban and peri-urban spaces, e.g. FarmPod, a fully automated co-production system of fish and hydroponics.

Local Ingredients
Local alternative ingredients e.g. Rooty - a potato-based alternative to noodles, rice and pasta for Finnish consumers.

Indoor Farming
E.g. 26 Seasons a New Zealand based vertical farming platform.

Floating Farms
Circular animal farming models adapted to urban settings, e.g. a pilot dairy farm system in Rotterdam.

DIRECT TO ME

Consumers are increasingly looking for products involving minimal effort and time. These include meal kits, ready-to-eat snacks, and single-serve items. Many of these products are designed to be more health-conscious than traditional convenience foods, with an emphasis on fresh ingredients and balanced nutrition.

With the growth of decentralised and democratised distribution technologies, brands and producers will interact directly with consumers, bypassing traditional retailers or intermediaries. These technologies enable brands to build relationships with their consumers, tailor their offerings to individual preferences, and gain unprecedented insight into consumer behaviour.

The global online food delivery market is valued at US$128 billion, growing by 7.2% per annum.[60]

Driven by:

Shifting consumer-supplier relationships: Enabled by new technologies that allow bypassing of the traditional intermediaries.[61]

Increasing urbanisation and growth of the middle class: These are time poor but with relatively high wealth, used to easy access to services.

The 'instant generation': Generation Z and younger are now used to social media and other innovations that give instant feedback.

Dissolving borders: Technologies enable decentralisation and cross-border societies. Power not defined by territory but control of flows of people, goods, money, and data. Increasing diversity creating wider tastes.

Delivery revolution: COVID-19 accelerated a trend towards home delivery, with increasing access to automated delivery and tracking systems.

Implications for New Zealand

Risks and barriers

- Limited food storage and transport infrastructure for direct to worldwide consumer.
- Overcoming regulatory requirements relating to direct food services in other countries.
- Costs of smaller/individual consignments.
- Little real knowledge about market dynamics, growth potential, or consumer behaviour exists.
- Delivery based markets can be impacted by supply-chain issues.

Opportunities

- Explore new channels of supply that are being enabled by technologies like block-chain that cut out the middle-person.[61]
- Develop better capability in direct-to marketing and supply to consumers in target countries to meet their requirements.
- Invest in tech solutions that enable direct-to consumer including traceability and other tracking applications that connect consumers directly into regulated safety systems.
- Connect New Zealand food producers with up and coming e-commerce, smart ordering and automated food preparation companies.

Enablers: technology developments are likely to transition this market from locally based e-commerce delivery companies to more personalised automated ordering and delivery systems. Ultimately, cross-border solutions could enable connection into worldwide supply.

Automated food preparing machines
These provide meals with minimum human intervention, connected to food ordering systems. Includes vending and home based, as well as 3D food printing.

Ready made food and meal kit delivery
Automated ordering and delivery systems incorporate tracing systems and checking for quality and safety. Integrated with other delivery systems.

AI – Smart kitchens
Single interface that recognises preferences, orders groceries, suggests recipes and assists with meal preparation. Sensors detect food spoilage and track ingredients.

E-commerce platforms
A wide range on offer will continuously expand including online delivery, meal subscription, online food marketplaces, and meal delivery platforms. Potential for a mega-company to emerge.

EXPERIENCE SEEKERS

Experience seekers are a growing group of consumers who don't just want a product or service, they want an experience. They want to engage with food products and services and develop meaningful brand relationships that foster a sense of fulfilment and belonging.[62]

They demand food experiences that are authentic, unique, memorable, and that meet their individual tastes. This group responds strongly to brand marketing.

58%
of global consumers believe it is important to spend money on experiences.[63]

Driven by:

Rise of experiential marketing: Consumers are looking for ways to engage with brands on a more personal level. This has led to a surge in experiential marketing, which focuses on creating memorable experiences for consumers that foster brand loyalty and strong emotional connection.

Personalisation: Consumers want brands to provide them with personalised experiences that are tailored to their individual needs, interests, and in-groups.

Technology: Technology is enabling brands to create more interactive and immersive experiences that are connected, interactive, and tailored to the individual.

Implications for New Zealand

Risks and barriers

- Many New Zealand food brands embrace traditional marketing formats and so may fail to grow at pace with growing markets.
- High start up and ongoing costs entering new markets and maintaining compelling consumer-orientated brands.
- Significant scale and long-term brand development are increasingly important in targeted markets.

Opportunities

- Implement long-term strategy for New Zealand's brand that builds in the New Zealand experience.
- Provide experiences through products that leverage New Zealand's brand image e.g. help consumers feel pure and natural.
- Emphasise cultural attributes and stories, and through novel ingredients that tell a story. There is particular opportunity here with Māori indigenous foods.
- Align service-driven products with New Zealand's tourism industry. Bring 'New Zealand experience' into overseas consumers' everyday lives.

Enablers: Work is underway on scent releasing, taste and texture devices such as electrical stimulation for VR and the field of molecular gastronomy is now well advanced.

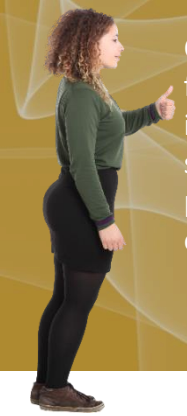
Virtual reality dining
Diners are transported to a virtual world where they experience dining at restaurants around the world. Guests enjoy the same sights, sounds and tastes as if they were in restaurant.

Indigenous/local food experiences
These foster connections to the culture of a country – e.g. Māori indigenous food, or full farm-to-table experiences.

Molecular gastronomy
This combines food chemistry to create dishes with unique and interesting textures, flavors and presentations. Combined with VR to create full immersion experiences.

Restaurants will connect into all these experiences with sustainable personalised, immersive and multi-sensory experiences. Many will grow their own ingredients or use innovative new ingredients.

BACK TO NATURE



Consumers in this group make conscious choices to include natural food as a staple of their diet. These consumers are aware of their impact on the world and will demand ethical practices, sustainability and zero carbon as a non-negotiable in the food production ecosystem. Some might also demand no additives and organically grown produce.

'Free from' claims rank the highest in western markets.[64]

The global consumer market for natural & organic products is estimated to be worth USD $360B by 2031.[65]

Driven by:

Health & wellness: The global wellness market is estimated at more than US$1.5 trillion, with annual growth of 7.5 percent.[66] Consumers are looking for ways to improve overall health, reduce stress and look better.

Environmental: Consumers consider environmental issues to be the most severe risk to the globe over the next 10 years, with Governments around the world are introducing policies to combat these.

Sustainability: Sustainability is becoming the 'new normal', with consumers now actively pursing products from companies that champion sustainability.

Food safety: An increased focus on food safety post-COVID. Natural foods are being sought by consumers due to both safety and nutritional value.

Implications for New Zealand

Risks and barriers

- Correlation between individuals who purchase natural foods and also want to purchase locally could disadvantage New Zealand due to our geographical location.
- New Zealand can lean on its clean green reputation, however by 2050 it is likely that this will be expected as standard and it may become more difficult to obtain a premium.

Opportunities

- Natural food fits well with the current New Zealand offering.
- New Zealand's regulatory controls on genetic modification compared to other countries could become a competitive advantage with this group of consumers.
- Revise and market our value proposition to include wider ethical and environmental practices as well as emissions reduction.
- Consider opportunities for 'contrary' or 'free from' offerings (e.g. 'free from artificial additives').

Enablers: Technologies and systems are emerging that enable consumers to purchase directly from natural food suppliers and trace food back to farms that follow sustainable practices.

Online markets
E.g. Thrive Market: Online grocery store that sells organic pantry staples, supplements, sustainable meet, 'plant-powered' cleaning products, and beauty products at discounted prices.

Increasing access
E.g. Imperfect Foods: an online grocery delivery service that sources and delivers fresh, imperfect produce at discounted prices. 'Farmers market quality at supermarket prices'.

Certification
E.g. In 2019, Amazon co-founded 'The Climate Pledge' which focuses on helping consumers find organic food and beverages that have been independently audited and certified.

Traceability
E.g. FoodChain ID: an app traces the origin of food back to the farm. The farms location and type of farming method is available for users. FoodChain ID also offers organic, and non-GM verification.

EVOLVERS

While consumers are typically less open to innovations in the food space than other areas, new market segments may begin to be carved out by 2050 as food security, safety and sustainability become bigger concerns for consumers, with affordability and nutrition necessitating greater variety in personal diets.

Greater openness to other cultures could also increase acceptance of food from cultures that are new to consumers.

Younger generations worldwide are more accepting of GM food.[67]

90%
Increase in microorganism-based proteins is estimated by 2030.[68]

Driven by:

A growing global middle class demographic with greater levels of expendable income and access to new markets and products.

Climate change, as well as **food safety and biosecurity threats** putting pressure on traditional food systems.

A growing understanding among consumers about what is required for food resilience and sustainability, and what options are available to them.

Ongoing globalisation and exposure to new cultures.

Implications for New Zealand

Risks and barriers

- Gene-edited and genetically-modified food are under strict New Zealand regulation at present.
- There is low public understanding about the new technologies.
- New Zealand's experience levels with development of novel foods.
- Food neophobia (fear of novel foods).
- Other reasons for rejection include unfamiliar sensory properties, price, how functional the product is perceived to be, disgust and feelings of unnaturalness.[69]

Opportunities

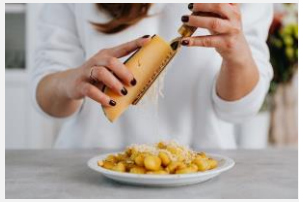
- Hold a conversation on gene editing and/or wider genetic modification technologies.
- Alternative proteins and gene-edited products may see an initial market in pet food and animal feed.
- Ensure that we protect our IP, e.g. strengthening of plant variety rights and bioprospecting, especially in relation to indigenous flora and fauna.
- Expand consumer knowledge of Māori culture and novel indigenous products.
- Better understanding of consumer acceptance of technologies and public education campaigns.

Enablers: Novel food products could arise from various technologies, including gene editing, fermentation, new ways of farming, nanotechnology and automation.

3D printed food
Initially used as a novelty, but by 2050, may be advanced enough to produce staples at home.

Nutraceuticals -
Made with indigenous food and fibre ingredients. Māori producers are likely to tap into indigenous bioactives.

Advances in GM
Allowing higher yields, improved nutrition, better taste, reduced need for pesticides, more sustainable production.



Alternative proteins
E.g. plant and insect-based protein and lab-grown meat as the cost of animal-based proteins increases.

INDIVIDUALISTS

Personalised nutrition is a field of nutrition science that focuses on providing advice tailored to the individual dietary and lifestyle needs of a person. By 2050, we expect this to be accelerated by technological advances that allow individualised treatments based on the consumer's unique microbiome, DNA, health measures, and personal goals. The link between food and medicine becomes blurred and individualised solutions to food intake to treat health issues becomes part of medical prevention and treatment.

66% think that a healthy diet depends on each persons own biology.[70]

52% of Asian consumers want food which is personalised to match their needs.[71]

Driven by:

Health & wellness: The wellness industry is booming, with more people looking for ways to improve their overall physical and mental health.

Aging populations: Increasing number of elderly worldwide looking to diet to address health needs and improve quality of life.

Pressure on health systems: Driving from a focus on treating disease to one focused on care and prevention, with a healthy diet as a key catalyst.

Cultural beliefs: Many consumers in the fastest growing countries connect health of the body with diet.

Economic: Cost of treatment for diet-related illness such as diabetes, the need to reduce waste, and the cost of feeding larger numbers of people.

Implications for New Zealand

Risks and barriers

- Focus on individualised health requirements means the cost of production is likely to be higher.
- There are a lot of unproven claims about the benefits of personalised nutrition.
- Lack of consumer awareness of personalised nutrition and its potential benefits.
- Access to personalised analysis and information may cause data privacy issues.

Opportunities

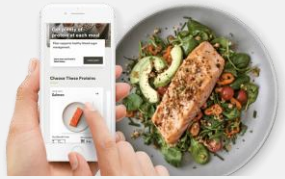
- Investment in research to develop individualised nutrition products to meet the specific needs of the growing and aging populations.
- Development of education services such as seminars, webinars, and other forms of outreach to inform consumers.
- Institute standards for personalised nutrition services, such as quality assurance and best practices – integrated with the health system.
- Consider integrating personalised nutrition solutions into the New Zealand medical system – and then selling the solutions to export markets.

Enablers: Advances in technology are making it easier for individuals to better understand their unique needs and target and track their diet to address health and wellbeing issues.

Supplements
e.g. Care/Of: an online vitamin and supplement subscription service. It offers personalised recommendations.

Smart tracking
Wearable devices, smart appliances, food sensors and AI combine to track consumer intake, e.g. Vitl: provides comprehensive health tracking solutions.

Targeted to DNA
e.g. Nutrigenomix: a personalised nutrition platform that provides recommendations tailored to an individual's genetic profile.



Personalised meal
Meal kit delivery services designed to match individual dietary requirements.

3.2 CONSUMER PATHWAYS: OPPORTUNITES IN 2050

We have categorised the main opportunities we identified in the consumer demand pathways into four promising areas. These are not all new but are likely to be growth areas to watch as technology and global trends push consumer preferences in this direction.

Weightless exports

Provision of IP and tech solutions, advisory services and experiences as well investment in offshore production.

Weightless exports are lower emitting, and would help us to diversify our options in the event of future shocks to our export markets.

Invest in technology – agritech, food and medical

- Sell IP to export markets – to help improve agricultural productivity and sustainability.
- Leverage rapid development in technology and digitisation: AI, big data, DNA testing, VR, and GM.
- Invest in off-shore food production/processing facilities to serve export markets locally.
- Partner with leading countries to build capability.
- Develop new varieties that excel in climate-controlled farming or as alternative proteins.

Provide food-based services

- Food education – especially related to origin, personalised nutrition and new technologies.
- Align our food and tourism industries. Integrate 'New Zealand experience' into overseas consumers' everyday lives.
- Experiences that leverage New Zealand's brand e.g. help consumers feel pure, natural and good.

Strong origin stories

Future consumers may be increasingly interested in origin stories of food, to add authenticity to their food experience.

Aotearoa's point of difference is its unique story. Building New Zealand's brand to leverage this may resonate well with the 2050 consumer.

Aotearoa New Zealand provenance stories

- Products that emphasise New Zealand provenance stories – including connecting our Māori, multigenerational farming, and pacific stories to the food we produce.
- Products that cannot be produced locally in other countries such as Māori indigenous products.
- Innovation in product development which utilises local ingredients in food products.

Traceability solutions

- Utilise technology that enhances traceability of the product journey through the supply chain, with the opportunity to connect consumers to the local producer community.

Premium/Value-add

Both our existing western markets and an urbanised middle class in growth countries may fuel demand for premium products.

Products that attract high premiums may reduce overall export volumes (and therefore transport costs) but improve our economic performance.

Food as medicine

- Aging consumers in all markets are likely to demand products with health and nutrition propositions, with supplements and traditional medicines particularly popular in Asia.

Personalised food

- Significant opportunities to tap into the personalised nutrition market.

'Natural' food

- Natural, grass-fed and organic food.
- Contrary offerings – with 'free from' claims.

Tech-based

- Develop tech-enabled, high-value food solutions, and reach consumers in new innovative ways to leverage high uptake of personal digital devices.
- Alternative proteins and gene edited products, initially in pet food and animal feed and may be increasingly accepted for human consumption.

Direct to consumer

Democratisation and decentralisation of markets could be common in 2050 - should we shift from customers to consumers?

Direct supply to consumers is occurring in many other sectors. It is an option given increasing bargaining power of our consumers.

Review channels of distribution

- Explore new channels of supply enabled by technologies that decentralise supply systems.
- Develop assurance applications that enable full traceability and connects directly into regulated safety systems.
- Develop better capability in connecting directly to export consumers in target countries.

3.2 CONSUMER PATHWAYS: OPPORTUNITES IN 2050

Initially, the opportunities arising from our consumer pathways may be niche and driven by start-ups or small and medium-size businesses. In the longer term, they could help diversify our portfolio of food exports, lift access to food for New Zealanders and reduce our environmental footprint.

OUR FUTURE EXPORTS

What new information and capabilities are needed to encourage development of innovative products and services to customers and consumers in emerging export markets?

Whatever the answer, we are unlikely to have the resources to do it all. Lack of clarity on the exports New Zealand pursues could also muddy our value proposition, or competitive advantage.

Identifying which areas are progressed will depend on the answers to some questions.

'Weightless' services vs products?

'Weightless' services such as food tourism, IP, advisory or offshore investment are unlikely to replace export of food ingredients. However, it is an area that enables us to tap into our expertise in efficient food production, reduce emissions and reduce reliance on bulk transport of goods. If we did want to pursue this area, then further development of capability, and support for IP and service delivery capabilities may be required, as well as links between different sectors.

What is needed to enable connection of our products to origin stories?

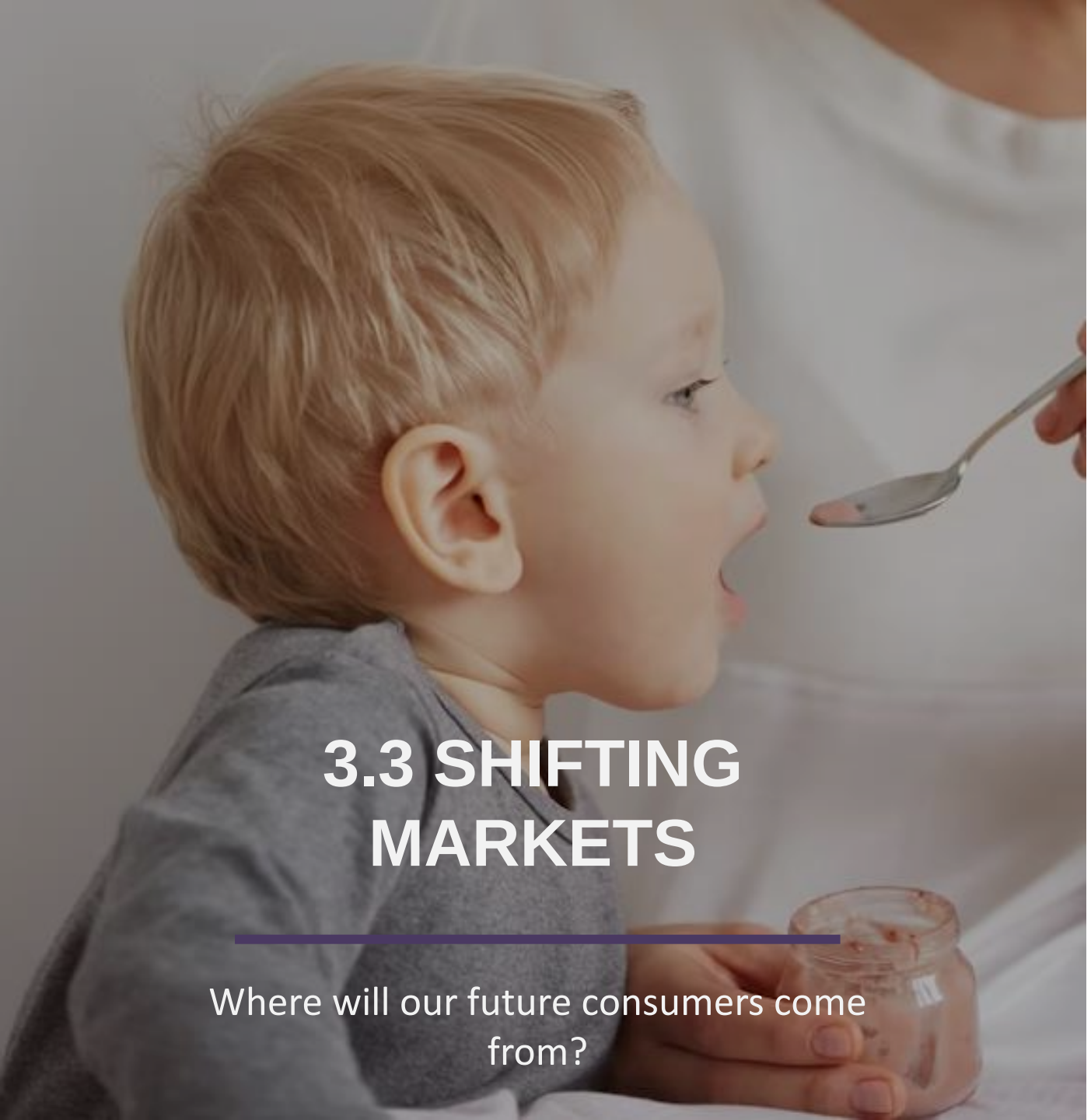
Many of the opportunities around enabling origin stories may involve the use of indigenous species. The adoption of these should be cognisant of WAI262 – the Treaty of Waitangi claim over indigenous flora and fauna. Work may be needed to ensure Māori IP and data is protected, including through counterfeit monitoring, strengthened plant variety rights and clarification on bioprospecting policy. Work on traceability tools back to origin for consumers will also be key.

Value-add: What decisions around genetic modification vs all natural production are needed?

Many of the opportunities relating to premium or value-add are not mutually exclusive, however, two of the opportunities; 'natural' foods and 'tech-based' may require future thought. A conversation on the use of genetic modification technology may be needed as consumers worldwide are increasingly willing to accept GM technology (especially the younger generations). This question would need to be included in wider discussions about our overall value proposition.

Direct-to-consumer or focus on customers?

While we have a strong 'transactional culture' in servicing business-to-business customers, New Zealand is not naturally set up to serve overseas consumers directly. Many New Zealand brands embrace traditional marketing formats and so are likely to find it difficult to keep up with consumers who are likely to respond better to direct-to and other digital marketing. Further work on how to support the sector in this area could be beneficial.



3.3 SHIFTING MARKETS

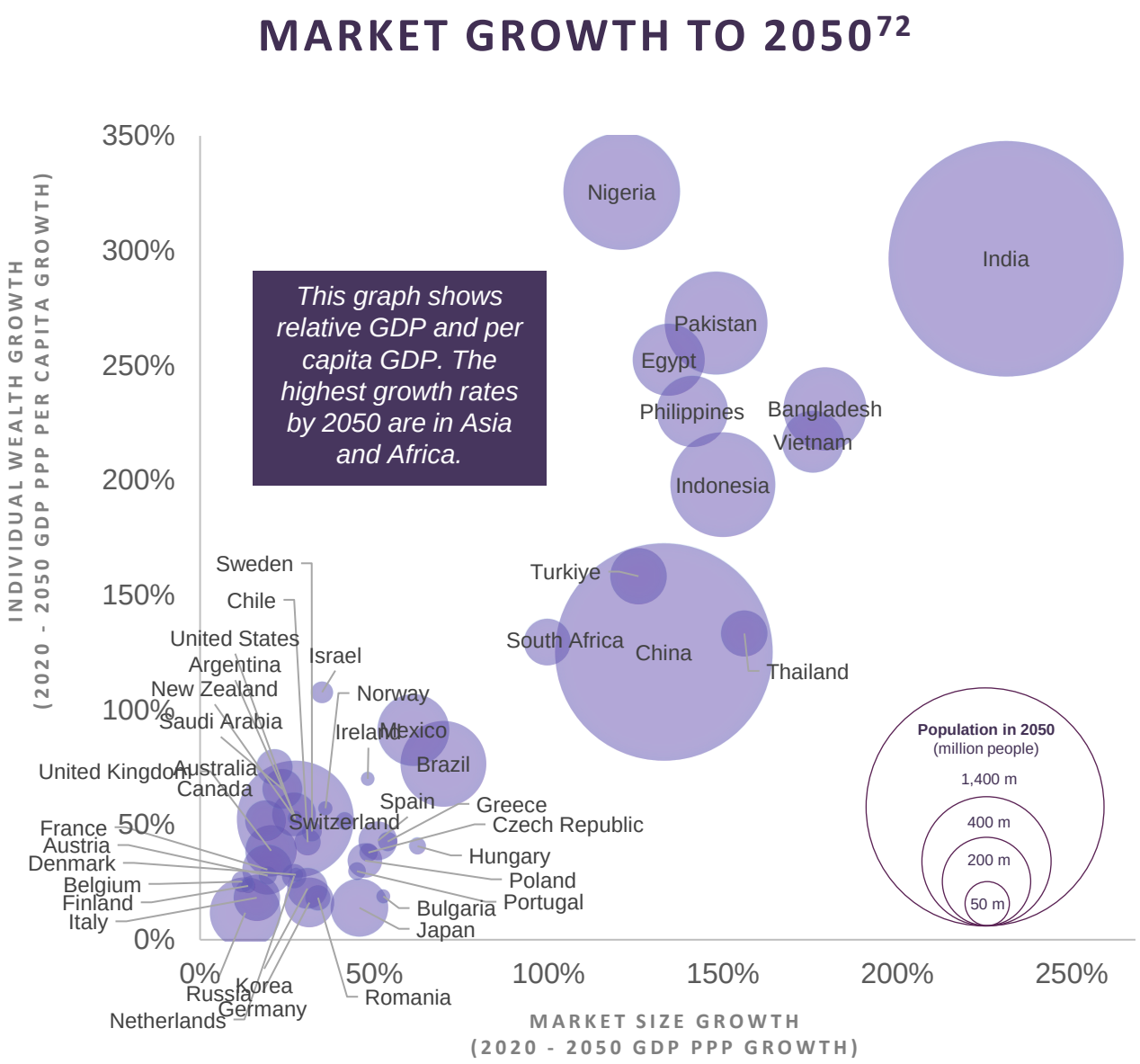
Where will our future consumers come from?

By 2050, while our traditional export markets will remain wealthy, we should also expect major growth in Asia and Africa – both in population and wealth.

In addition, the 3 billion people who will enter the middle class by 2050 are likely to almost exclusively come from today's emerging markets.[8]

One way to protect against shocks to New Zealand's 2050 exports is to consider whether we can diversify the portfolio of markets we serve. Knowing which markets are likely to have the best fit with the future consumer demand pathways may help us to decide.

3.3 SHIFTING MARKETS – GROWTH TO 2050



Traditional markets

We remain well placed in our traditional markets in Europe, the US, North-Asia and Australia. They have sizeable and wealthy consumer populations, with GDP per capita continuing to increase by 2050. We are familiar with these markets and have built relationships with them over a long period of time.

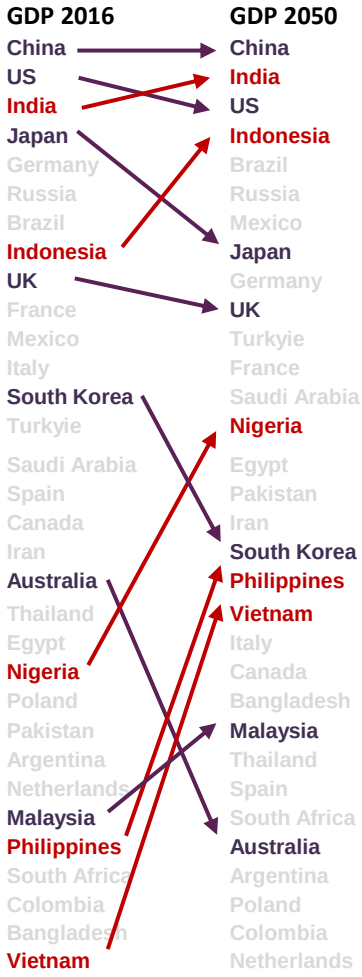
They are relatively low risk characterised by low growth, relatively stable prices and more stable consumer preferences. Demand for our existing products is likely to remain strong – for example, projected meat and dairy imports by China are expected to increase 20 percent by 2050.[73]

Growing markets of 2050

By 2050, many countries in Asia and Africa are expected to experience extremely high rates of growth. While many are coming from a lower per capita income base than our traditional markets, all are moving up the GDP ranks. In particular, the three billion people who will enter the middle class by 2050 will almost exclusively come from today's emerging markets.[8] GDP per capita for South-East Asia and India are expected to match China's current level by 2050.[74]

They are higher risk with several barriers to entry at present, but potentially high reward. For example, food demand in India is expected to outstrip its ability to provide for the domestic market by 2035. They are characterised by varying prices with a longer term upward trajectory as a result of increasing wealth and faster-moving consumer preferences.

GDP rankings

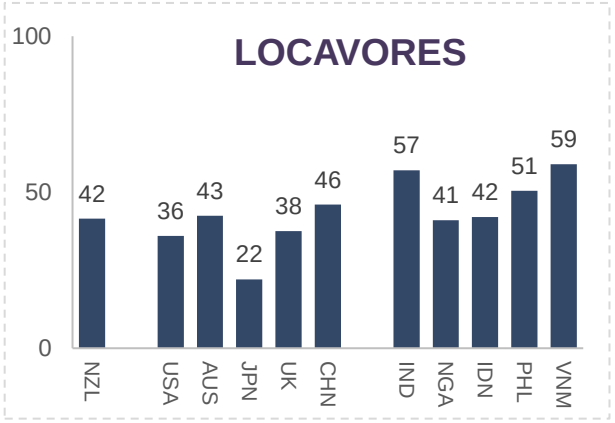


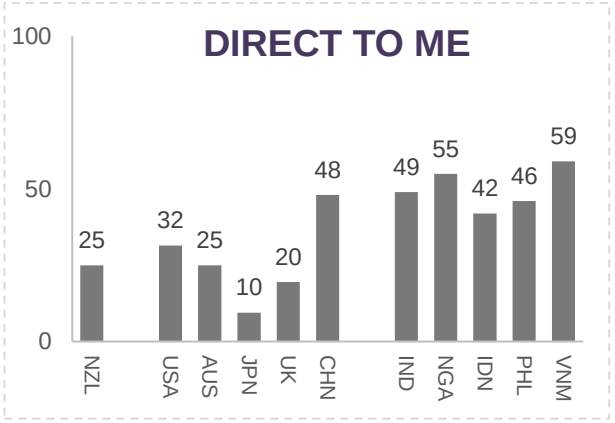
3.3 MARKET FIT WITH CONSUMER DEMAND PATHWAYS

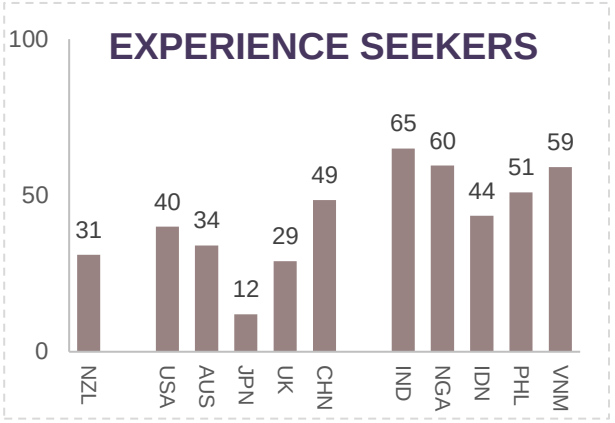
We assessed consumer preferences in some sample high-growth markets and our traditional markets to understand the level of interest in our six consumer demand pathways.

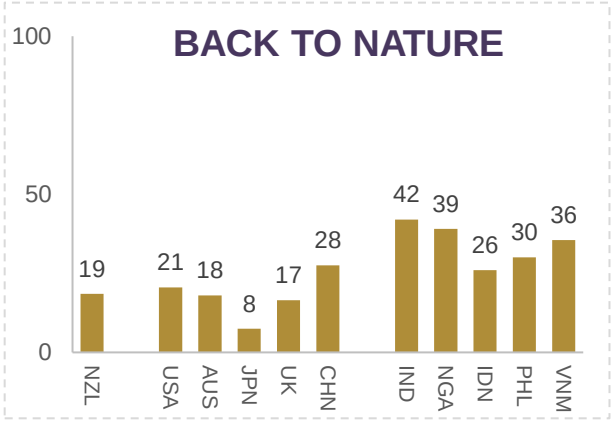
Our initial analysis shows the growing markets of Asia and Africa have consistently higher levels of fit with the demand pathways. Our traditional markets, with the exception of China, have consistently lower fit with the demand pathways. However, traditional markets do show higher potential for 'Locavores' and 'Experience Seekers'.

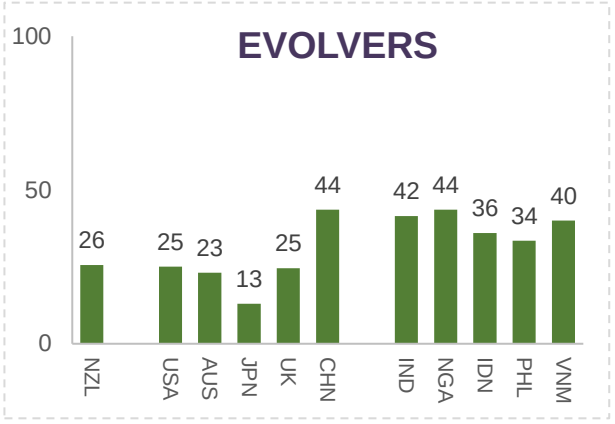
More detailed analysis is required to properly understand the market fit of all the different markets with our consumer demand pathways, and in particular how these might change out to 2050. But, this analysis does show how market and consumer knowledge can guide our choices.

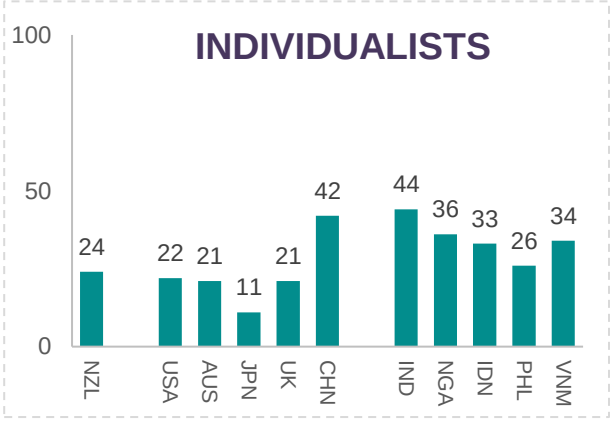












NZL – New Zealand, ***TRADITIONAL MARKETS:*** *CHN – China, USA – United States, AUS – Australia, JPN – Japan, UK – United Kingdom,* ***GROWING MARKETS****: IND – India, NGA – Nigeria, IDN – Indonesia, PHL – Philippines, VNM – Viet Nam.*

For each market, a higher score means that consumers are more aligned ('have better fit') with the demand pathways. To assess market fit with the demand pathways, we examined the results of six recent multi-market consumer surveys by Euromonitor[75] and Mintel.[76,77,78,79,80] We looked for measures in these studies which capture the essence of what each demand pathway represents. For example, for 'Individualists' we used survey questions which asked consumers if: *They want food products and services uniquely tailored to them; Own fitness wearables/health tracking devices; Are interested in future food concepts where food is personalised to match their DNA characteristics; Are willing to pay more for food/drink which is customised to their nutritional needs.; and Use apps for diet and/or nutrition tracking and advice.*

3.3 SHIFTING MARKETS – 2050 OPPORTUNITES

While consumers in our current markets will remain wealthy, with growing wealth in Asia and Africa. there is potential to complement and diversify our existing portfolio of export markets. But we will need more information before we can make these choices.

OUR FUTURE EXPORTS

Is the balance right between our traditional markets and those in potential growth markets?

There is potential to diversify to add some of the growing markets, especially our Asian neighbours to our portfolio of markets given that it is possible that their growing middle classes may be more likely to be interested in the consumer pathways.

Work by the Asia New Zealand Foundation indicated that New Zealanders have a low level of knowledge about Asia's sub regions. Only 22 percent know a fair amount about South Asia, while 30 percent know a fair amount about South-East Asia.[81]

As noted by Price Waterhouse Cooper in its recent analysis of changing Asian consumers, "a deeper, more granular grasp of consumers' behaviour and food trends across Asia's heterogenous markets will be needed to allocate capital efficiently and capture higher returns".[82] This will be needed as a precursor to trade agreements and removal of barriers in these markets.

How do we develop understanding of consumers in the growing markets of 2050?
We will need more detailed studies to better understand the consumer preferences of potential emerging markets, including their market fit with the consumer demand pathways as well as our our traditional export mix. We will also need to build cultural capability and diversity into New Zealand's government and food sector leadership, tapping into our own increasingly diverse population.

How do we build recognition of our value proposition with growing markets?
Many of the growing markets present challenges for New Zealand, ranging from cultural differences to trade barriers. There are long lead times to building relationships. In addition, development of growing markets may require us to build cognitive recognition of our brand with end consumers in those markets, possibly starting first with local expat communities. Again, long lead times are needed, in the order of decades.

A note on future New Zealand consumers

Our draft briefing is focused on export opportunities arising from international consumer demand by 2050. What might changing consumer demand mean for our domestic markets? As worldwide demand for food increases and our export markets pay more for our produce, costs to our domestic consumers may also increase. This may result in accelerating demands to 'feed New Zealanders first' and for governments to ensure that food remains affordable. Improving our wealth per capita by increasing the value of our exports will help. However, it is likely that future New Zealand consumers will expect governments to address equity issues relating to food access, including ensuring New Zealanders' food security.

There is likely to be an increasingly diversified range of opportunities from a wider range of products and markets by 2050.

Future reputation

New Zealand has built a reputation as a safe and sustainable food provider.

By 2050, expanding core consumer demands means that this may not be enough to differentiate ourselves to future consumers.

Future exports

Six consumer demand pathways might be driven by global trends: 'Locavores', 'Direct-to-me' 'Experience seekers', 'Back to nature', 'Evolvers', and 'Individualists'.

These consumer-driven pathways are already emerging but global drivers and technology are likely to accelerate them.

They present a wide range of opportunities in weightless exports, strong origin stories, premium and value-add and direct-to-consumer that we could explore if we want to diversify.

Future markets

While existing markets could still sustain our future economy, there is also potential in growing markets of 2050 – notably in many of our precursor Asian neighbours.

These markets have a diverse range of preferences, and they also appear to be more aligned with the six consumer demand pathways than our traditional markets.

More work will be required to understand and develop these markets if we choose to pursue them.

04

FOOD FOR THOUGHT: SO WHAT?

- 4.1 Summary of options to unlock opportunities
- 4.2 Are we in position to capture opportunities?
- 4.3 Conclusion
- 4.4 What do you think? Call for submissions

Our exploration of the nature of consumer demand by 2050 shows that the future looks bright for New Zealand – with potential in every direction.

But we will need to make good choices to capture the opportunities.

In this concluding part we summarise the options that we could consider to unlock these opportunities, and briefly discuss how well we are positioned to capture them.

4.1 OPTIONS

A summary of the options that we could think about if we want to unlock opportunities emerging from our consumer demand pathways.

4.2 CAPTURING OPPORTUNITIES

A discussion about some of the wider things we might need to think about to capture the opportunities.

4.3 RECAP

Bringing it all together.

Let us know what you think! **Section 4.4** describes how you can add your insights.

4.1 OPTIONS TO UNLOCK OPPORTUNITIES

In our exploration of consumer-demand for food exports by 2050, we identified a range of opportunities that could be generated from changing consumer demand related to our reputation, our exports, and our future markets. We summarise some options here:

Our reputation

Is New Zealand's value proposition likely to keep pace with changing consumer needs? Options to consider are:

Build New Zealand's long term value-proposition

Develop a long-term value proposition to aim for, that includes our current advantages and reflecting changing consumer needs.

Build advanced assurance systems

Support development of advanced traceability and certification systems that enable consumers and regulators to directly confirm where their food comes from and that it meets their needs.

Plan to respond to reputational shocks

Emergency planning may need to include understanding and preparation to respond to end-consumer reactions.

Our exports

Our six consumer pathways lead us to a range of possibilities in four promising areas: weightless exports, origin stories, premium and value add, and direct to consumer. Options to consider to develop these further are:

Support to develop weightless exports

Weightless exports could reduce our reliance on bulk goods. Support for IP and service development may be needed.

Address IP issues related to indigenous flora and fauna

Māori IP and data is protected, including through counterfeit monitoring, strengthened plant variety rights and clarification on bioprospecting policy.

Check our stance on genetic modification

Many opportunities rely on use of biotechnology. A conversation about how to take advantage of this and maintain our reputation for 'natural' foods may be useful.

Build direct-to consumer capability

Direct-to and other digital marketing capability could be developed.

Our markets

There are opportunities to diversify into the growing markets of 2050, but there is work to do to build our own understanding, relationships and brand recognition. There are long lead times for this work.

Develop cultural competencies in high growth markets

More detailed studies may be needed to better understand the consumer preferences growing markets and build cultural capability and diversity into New Zealand's leadership.

Build recognition of our value proposition

It takes a long time to build cognitive recognition of New Zealand's brand with end consumers. This could start first with local expat communities in the growing markets of 2050.

4.2 ARE WE IN POSITION TO CAPTURE OPPORTUNTIES?

Our discussions with industry and other sector leaders also revealed some wider questions and challenges that need to be addressed if New Zealand wants to capture consumer-driven export opportunities. We suggest some additional options to address these points.

Key points raised by sector leaders included:

- **Inspiration to pursue new opportunities:** Many sector leaders said that support to explore new long-term possibilities that align with our national brand would boost their ability to progress these opportunities.
- **Technology:** Many of the opportunities require funding and strong capability in a wide range of technology and research and development (R&D) fields.
- **Access to talent:** Many of the opportunities require skilled R&D, tech and marketing professionals.
- **Access to capital:** There are high start up costs for entering new markets, maintaining compelling consumer-orientated brands, adopting new farming methods and scaling new technologies.
- **Our infrastructure:** For example, a move to larger ships may cause issues for our port infrastructure. New farming techniques, like vertical farming or precision fermentation often require high energy inputs.
- **Links with other markets:** Many of these opportunities we have identified overlap with our other export sectors – like health, tourism, the Māori economy, education, and digital and other innovation.

Many challenges have already been recognised through existing government programmes including **Fit for a Better World**[83]**, industry transformation plans**[84] and Māori economic strategies **He kai kei ahu ringa**[85] and Rautaki mo te Taurikura[5]. Other major strategies in the health, tourism, education and innovation sectors may also include actions that are relevant.

Leverage existing work programmes

Lean in to existing programmes like Fit for a Better World, Industry Transformation Plans and Rautaki mo te Taurikura. These include actions relating to technology, talent, capital and infrastructure.

Inspire and support our exporters

Build knowledge and capability to explore 2050 consumer demand opportunities.

Explore linkages between food and other markets

A wider conversation about whether and how to support connections between the food, health, education and innovation sectors to better capture cross-sector opportunities emerging from the consumer pathways could be useful.

4.3 RECAP OF THE BRIEFING

The future is bright for New Zealand's food sector

In our exploration of the future of our food exports by 2050, looking through a consumer-demand lens, we found that there is potential in every direction for New Zealand's future food exports. There is likely to be ongoing demand for New Zealand's existing product mix focused mostly on ingredient-buying customers as well as a range of new opportunities to diversify and serve emerging end-consumer needs and aspirations. By diversifying our export mix and market coverage, we may be able to increase the resilience of our food export industry, bolster the reliability of our returns, potentially improve our environmental footprint, and help achieve our Fit for a Better World objectives.

We explored six possible individual consumer demand pathways to watch: 'Locavores', 'Direct-to-me' 'Experience seekers', 'Back to nature', 'Evolvers', and 'Individualists'. These market segments are already emerging, but global drivers and technology are likely to accelerate them. They present a very wide range of opportunities in weightless exports, strong origin stories, premium and value add, and direct-to-consumer products that we could explore.

A significant population swing to Asia and Africa, with major increases in the middle classes in these countries by 2050 also lead us to question the balance between markets we pursue going forward. We found that there is likely to be no shortage of demand from both our traditional markets as well as some of the high-growth markets in 2050 – notably our neighbours in South-East Asia and India. In our initial assessment of market fit with our six consumer demand pathways, it was interesting to note that consumers in some sample growth markets may be more aligned with the future demand pathways than consumers in our traditional markets. But we will need more detailed consumer and market-led research to fully understand which markets are most likely to bear fruit.

We will also need to make good choices to capture the opportunities. While we have built a reputation as a safe, efficient and sustainable provider of quality food, by 2050, as core consumer needs expand and preferences change, this may not be enough to differentiate ourselves with the consumers of 2050. So, we will need to be proactive to ensure that we maintain and enhance our current comparative advantage.

We have posed three fundamental questions for discussion:

1. **Our future reputation:** Is New Zealand's value proposition likely to keep pace with changing consumer needs?
2. **Our future exports**: What new information and capabilities are needed to encourage development of innovative products and services to customers and consumers in emerging export markets?
3. **Our future markets**: Is the balance right between our traditional markets and those in potential growth markets?

Opportunities are already emerging and there are long lead times to capture them. Let us know your views on these questions and the range of options that we have suggested as next steps that future decision makers, including government, the sector and communities, could take.

Our journey into consumer demand for food by 2050 has revealed a wide range of opportunities that Aotearoa New Zealand could pursue.

Many of these are emerging now. Lead times to capture them are long.

We will need to start now if we want to take advantage of them by 2050.

4.4 WHAT DO YOU THINK?

Ministry for Primary Industries
Manatū Ahu Matua

We would love to hear your insights and ideas on our draft Long-term Insights Briefing - by Friday 24 February 2023.

Your perspectives will help us to finalise the Briefing before it submitted to the House of Representatives. From there, it goes to a Select Committee for consideration.

Some questions to ponder

1. On pages 18-21 in the Briefing, we talk about core consumer needs and New Zealand's food reputation. With this in mind, do you think New Zealand's current value proposition is likely to keep pace with changing consumer needs?

2. Our future exports: On pages 22-31 of the Briefing, we share some possible consumer demand pathways and the opportunities they may present for New Zealand's food sector by 2050. What new information and capabilities do you think are needed to encourage development of innovative products and services to customers and consumers in these key areas of opportunity?

3. Our future markets: We share some analysis on emerging growth markets on pages 32-35 of the Briefing. What do you think is the appropriate balance between our traditional markets and those in potential growth markets?

4. What do you think of the options we have suggested for capturing the opportunities arising from consumer-led demand out to 2050 (summarised on pages 39-40)?

5. In the above questions, should government play a role or should this be left to the food sector?

6. What other insights has the draft Briefing generated for you?

How to contribute

1. Download a submission form on the questions mentioned here and submit to ltib@mpi.govt.nz

2. Join one of our **online info and chat sessions**. To register email ltib@mpi.govt.nz with your preferred time:
   - 1.30 pm, 9 Feb 2023
   - 11.00 am, 17 Feb 2023.

3. Request a 30 minute **one-on-one meeting** with us by emailing ltib@mpi.govt.nz.

4. Consultation closes on 24 February 2023.

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