

FOOD, FARMING AND OUR FUTURE



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A PLAN FOR AUSTRALIA + NEW ZEALAND'S PROSPERITY

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The New Zealand and Australian teams take a leadership role in KPMG's Global Agribusiness network. We work with participants throughout the industry, from small scale farmers and producers, to input suppliers, technology companies, through to the largest processing, distribution and exporting businesses.

We are passionate in working with the primary sector to grow a more prosperous future for both countries.

future[inc] FOREWORD

A PLAN FOR AUSTRALIA • NEW ZEALAND'S PROSPERITY

In the last twelve months, our **future[inc]** series has looked at what we need for continued prosperity in Australia and New Zealand. Our latest in the series, *Food, Farming and our Future* dives in to how we can create farming systems to feed a prosperous future. It's no secret that the rapid urbanisation of the 20th century has driven a massive change in our lifestyle and diet.

What is perhaps less well understood is the dramatic cultural shift that accompanied this, as immigration and urbanisation has left most Australasians with no family connection to the farm, and some children with the impression that food comes from a packet – not a paddock or pasture.

Farming will be at the centre of Australia and New Zealand's future economic prosperity, but disruption will leave its mark – the sector tomorrow will not be the one we know now.

The tools of farming have moved from tractors and ploughs, to iPads and drones and will shift to precision agriculture, alternative foods and on-farm robotics.

Attracting talented people to the farming sector will be crucial. People with a wide range of talent and skills will be needed so the long term potential of agriculture to the economies of Australia and New Zealand is realised.

Similarly, the markets for our produce will shift. While Australia and New Zealand are often viewed as the food bowl of the Asian region, our farmers collectively can only provide sufficient food to feed around 100 million people, or just over 1 per cent of the global population by 2050.

As a consequence, one source of future prosperity lies in providing a small proportion of the diet to a much more significant number of affluent consumers.

But this is not the only answer.

Join the conversation.



Lee White
CEO,
Chartered Accountants ANZ

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FARMING WILL BE AT THE CENTRE of Australia and New Zealand's **future economic prosperity**, but disruption will leave its mark – the sector tomorrow will not be the one we know now.

LEE WHITE
CEO OF CHARTERED ACCOUNTANTS AUSTRALIA AND NEW ZEALAND

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Farming businesses in New Zealand and Australia have changed significantly over the last fifty years. The minimal government subsidies farmers receive in both countries has forced them to become more productive to earn a living.

EXECUTIVE SUMMARY

They have had to build connections with markets to sell product surplus to domestic demand. As a result the region has developed some of the most productive, efficient farming businesses in the world with very little in common with traditional perceptions of a farm.

It is time for the traditional image of the farm to evolve; the farmer of the future is more likely to be managing his farm via drone and iPad than the tractor and be demonstrating the environmental protection measures inherent in his farming system to customers than talking to his animals. The industry needs to stand up and take a lead in shaping more realistic perceptions of modern farming.

The future of farming in Australasia and the value it creates will be based on innovation across our farming systems. Evolving markets,

climate change, disruptive technologies, novel foods, resource constraints and many other factors mean that continuing to do things the same way they have been done for decades will see competitive advantage lost, the social license to operate constrained and transformational opportunities to create new value from land missed.

PEOPLE RATHER THAN STRUCTURE WILL SUSTAINABLY MAXIMISE THE VALUE GROWN

For many commentators the increasing complexity of the global food system and the subsequent demands this places on the range of skills and capabilities required in a farming business has led them to conclude the future for farming is increasingly corporate. They argue that traditional family farming

businesses lack the scale or co-ordination to satisfy the increasing numbers of customers, who are looking for security of supply and consistency of quality at the same time as putting suppliers under pressure to keep prices low. Their conclusion is that traditional family based farming systems, that have dominated agriculture globally for millennia, can no longer deliver the food the world needs and consolidation into larger scale, corporatised farming businesses is the only possible option for the industry if it is to satisfy demand and maximise value.

It is too simplistic to conclude that there is no place in the future for a family farming business as the argument misses the key attribute of family businesses; their immense diversity. Family farms range in size and complexity from the lifestyle farmer (who farms because they always have and love the ability to work independently in the outdoors) through to multiple location businesses, employing innovative technology to support data based decision making, drawing on the experience of independent Directors and working in partnership with external capital providers.

There is no correlation between the ownership model of a farm and its productive potential; the ability of any farm to realise its potential depends largely on the capability of the people running the farm, their willingness to innovate and their engagement in the value chain beyond their farm-gate.

Evolving markets, climate change, disruptive technologies, novel foods, resource constraints mean **CONTINUING TO DO THINGS IN THE SAME WAY** will see competitive advantage lost.

SEAMLESS ALIGNMENT TO A VALUE CHAIN BECOMES A MUST HAVE

Demand for food is growing as the global population expands and becomes richer. The food growth story is attracting new money and disruptive innovators into the industry. This is creating a wealth of opportunities for our farmers. The multi-billion dollar question for the farming sector, and the wider economies of Australia and New Zealand is whether farmers have the capability and desire to grasp the opportunities available and capture more of the value inherent in the products that are grown in this region.

Recognising that a farm business is a critical link in a plate to pasture value chain that is focused on supplying the products high value consumers are demanding around the world will enable a farmer to capture more of the value created by the products they grow.

Acknowledging that the farm is providing high quality food for somebody to eat makes a farmer think carefully about the person who is eating their food and the experience they are looking for. Australia and New Zealand's farmers collectively can only produce sufficient food to feed around 100 million people (just over 1% of the global population by 2050) and as a consequence the future of our farming sector lies in providing a small proportion of the diet to a much more significant number of consumers.

If our farmers focus on providing just 5% of the diet of existing and emerging affluent consumers, this could see them selling premium food and beverage (as well as natural fibre garments and timber products) to 2 billion people. The aspiration for the industry should be to be producing products that add excitement and colour to the lifestyles of these consumers, which they aspire to use as they say something about their economic status and lifestyle. Our farmers should be producing the products that populate the world's delicatessens and boutiques.

It is not news that **THE WORLD NEEDS MORE FOOD**. Since the start of the industrial revolution triggered urbanisation of the global population, the farming sector has been challenged to meet the growing demand for food. Farmers have responded by increasing land under cultivation, introducing higher yielding crops and better animal genetics and adopting a wide range of production innovations. This has resulted in an exponential increase in the amount of food grown around the world.

INTRODUCTION

How successful have farmers been in feeding the world? The answer depends on which 'world view' you adopt. The global population has grown to over 7 billion people. The majority are being adequately fed. However there are also around 800 million people without enough food and thousands of children dying everyday through malnutrition.

It is hard to conclude that the world's food system is truly effective with so many people still hungry. Yet farmers are facing a massive dual challenge: the continued rapid growth of the global population at the same time as increasing numbers of middle class consumers in developing countries, who will use the type and quantity of food they eat to highlight their enhanced economic status.

Estimates vary as to the amount of additional food the planet needs to grow to meet both the fundamental and aspirational needs of the global population. Expectations that the food supply will have to grow by at least 70% by 2050 has raised the profile of the farming sector. Food is at the top of the agenda for many governments, attracting new investors

into the industry and demanding greater innovation across the agricultural value chain.

It is against this background that both the Australian and New Zealand governments have turned to farmers with bold expectations of the contribution that they will make to the future economic growth of their countries. With the contribution from the mining sector weakening in Australia and the economic boost from the rebuild of Christchurch having peaked, both countries are increasingly recognising the strategic potential of their agricultural assets in a food constrained world.

The unprecedented demand for food means how food is produced, processed and consumed will evolve in many ways over the next 20 years. For farmers in Australasia to deliver on their potential, change is necessary; what has created their success to date does not guarantee success into the future. This paper explores how our interaction with food may evolve in the coming decades and the implications this may have on farmers in Australia and New Zealand.

SNAPSHOT

COMPARISON OF AUSTRALIAN AND NEW ZEALAND AGRICULTURE

AUSTRALIA

NEW ZEALAND

60 million people	Currently estimated to produce sufficient food to feed	40 million people
60%	Percentage of food production exported	95%
16.4%	Agricultural products as a percentage of total tradable exports	72.1%
• Beef and veal • Wheat & barley • Wool • Wine	Key agricultural export categories	• Milk products • Beef & lamb • Forest products • Fruit
2.5%	Agriculture's value added contribution to National GDP	6.9%
11%	Percentage of population living outside urban centres	14%
4.45	World Economic Forum Innovation Index Ranking	4.34
67,468	GDP per capita in USD (2013)	40,842
2%	Government support for agricultural producers (Percentage of farm income)	1%
0.40%	Average annual growth in gross agricultural production (2001 to 2012)	1.36%
1.16%	Total Factor Productivity growth of agricultural sector (Annual growth, 2001 to 2012)	0.98%
65%	Percentage of exports to markets with free trade agreements (prior to TPP)	51%
3.6%	Percentage of population employed in agriculture	7.0%
52	Average age of a farmer	48
6	Universities ranked in the Top 50 for agriculture and forestry	1
82.40	Yale University Environmental Performance Index (2014)	76.41
81.0	Transparency International Corruption Perceptions index	91.0

ADDITIONAL SOURCES: National Farmers Federation; Farm Facts accessed from www.nff.org.au/farm-facts.html; ABARES; Agricultural Commodity Statistics 2014; 16 December 2014, Statistics New Zealand; Overseas Merchandise Trade; August 2015; September 2015, World Bank; Databank; Extracted October 2015, CIA; Factbook; Extracted October 2015, QS Top Universities; World Universities Ranking by Subject 2015; Agriculture and Forestry; Extracted October 2015, US Department of Agriculture; Agricultural Total Factor Productivity Growth indices for individual countries 1961 to 2012; Updated 16 October 2015 [Total Factor Productivity is a measure that looks at growth in inputs into agricultural systems and compares with the growth in outputs]

AUSTRALIAN FARMING TODAY

- Agriculture generates 2% of Australian GDP, however the slowdown in the mining and resources sector has made it a priority by Federal and State governments who see it as a key pillar for economic growth. Opportunities exist to increase value derived from agricultural production by repositioning the sector from selling commodities to marketing value enhanced food products.
- The diversity of the Australian continent provides climate zones that support a huge variety of agricultural activity. Australian farmers grow 93% of the food consumed in Australia which is only possible due to climatic variation, enabling regions to support the production of tropical crops, such as sugar and bananas, while others are suited to temperate products, including vegetables and livestock.
- Risks to the productive capacity of land as a result of climate change are potentially significant in the coming decades. Higher temperatures and lower rainfall are predicted to lead to a decline in cropping and livestock farming across southern Australia; 20% less rainfall could reduce pasture productivity by 15% and livestock weight gain by 12%, as well as attracting disease south, all impacting on farm incomes.

FIGURE 1: CLIMATE CHANGE SCENARIOS FOR AUSTRALIA



- The recently launched Agricultural Competitiveness white paper sets out the Australian Government's vision for a stronger farming sector. The white paper sets out five key policy priorities to create the environment needed to drive better returns for farmers, which is expected to drive investment, new jobs, stronger regional communities and economic growth.
- Around 65% of the agricultural produce grown by Australian farmers is exported, worth A\$41 billion annually. Agriculture accounts for 15% of Australia's tradeable exports, with beef and veal being the largest single export category (particularly when both live animals and processed meat are included).

FIVE PRIORITY AREAS:



A FAIRER GO FOR FARM BUSINESSES



BUILDING THE INFRASTRUCTURE OF THE 21ST CENTURY



STRENGTHENING OUR APPROACH TO DROUGHT AND RISK MANAGEMENT



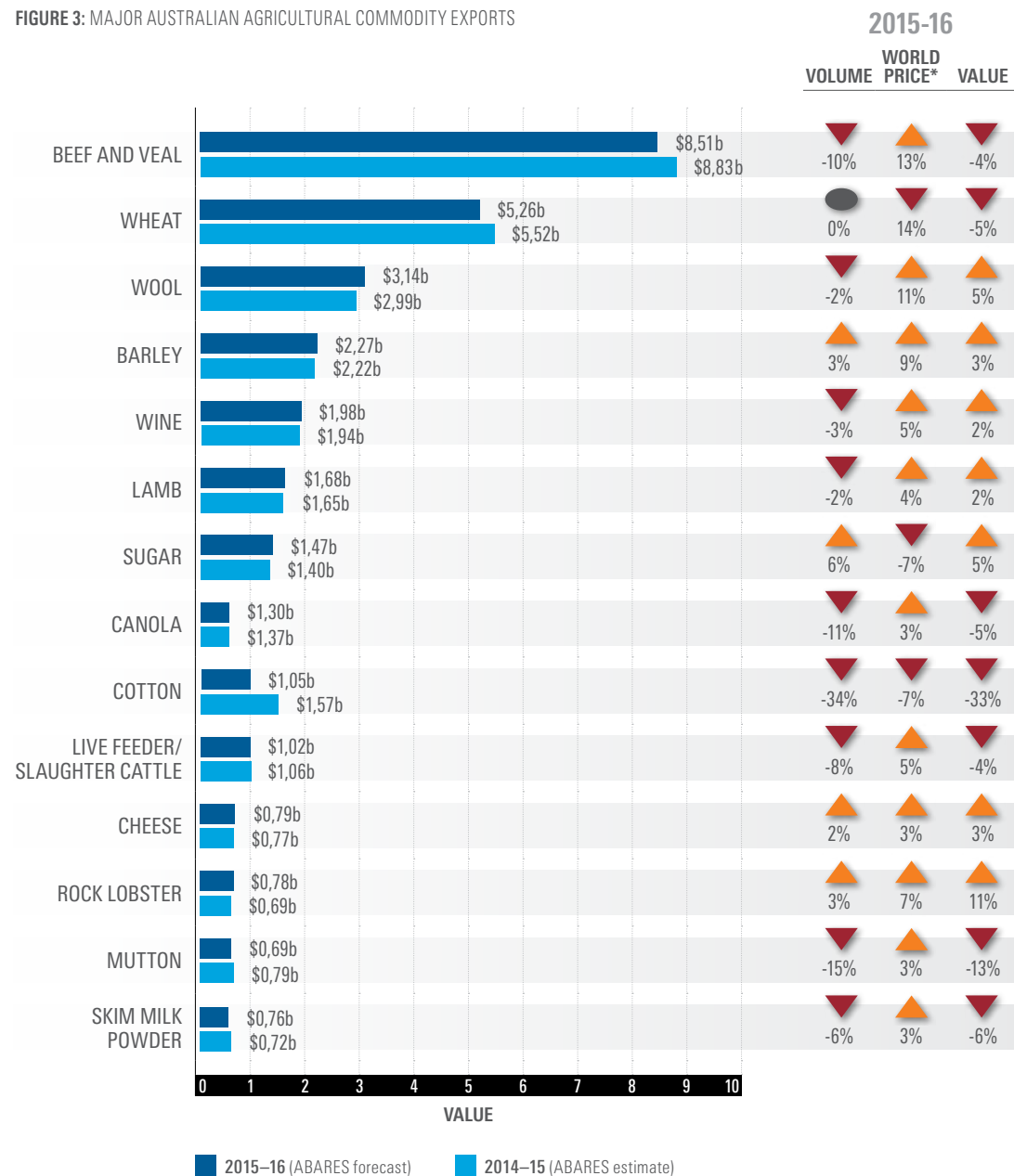
FARMING SMARTER



ACCESSING PREMIUM MARKETS

FIGURE 2: PRIORITY AREAS FOR THE AUSTRALIAN GOVERNMENT

FIGURE 3: MAJOR AUSTRALIAN AGRICULTURAL COMMODITY EXPORTS



* Wheat, barley, sugar, canola, cotton, cheese and skim milk powder are world indicator prices in US\$. All other commodities are export unit returns or domestic prices in A\$

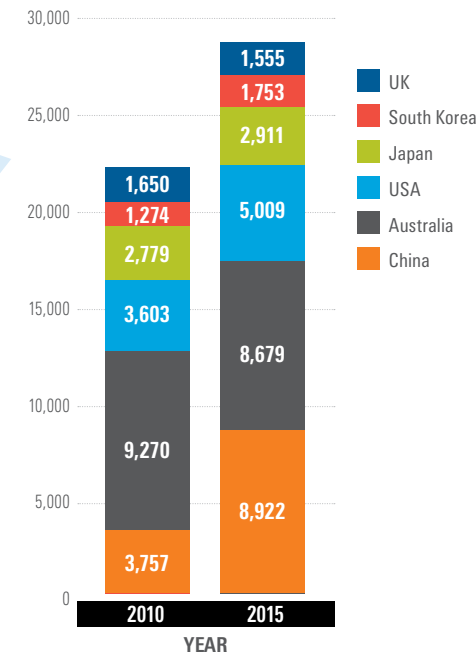
- The Millennium drought in South East Australia (2001/09) focused attention on managing water availability. The drought drove water reforms in the Murray Darling Basin, however development has been constrained by varying perspectives on water use between stakeholder groups. The lack of a burning platform means much is still to be done on water availability in other regions of the country.
- Australian farmers are able to produce sufficient food to feed 60 million people. The food Australia has available for export would feed around 2% of the Asian population, raising questions about claims that Australia can become 'Asia's food bowl'.
- The Abbot government responded to public concerns about strategic primary sector assets being sold to foreign investors. Initiatives included decreasing the hurdle for regulatory review of agricultural land purchases from A\$252 million to A\$15 million and not approving a A\$3.4 billion bid for GrainCorp by US based Archers Daniel Midland.
- Australia recently concluded a Free Trade Agreement with China, adding to nine existing agreements, and resulting in 65% of trade being conducted under market access arrangements. Negotiations continue for FTA's with India and Indonesia as well as four plurilateral agreements, including the Trans Pacific Partnership, to cover a further 6% of exports.

The food Australia has available for export would feed around 2% of the Asian population, raising questions about claims that Australia can become 'Asia's food bowl'.

NEW ZEALAND FARMING TODAY

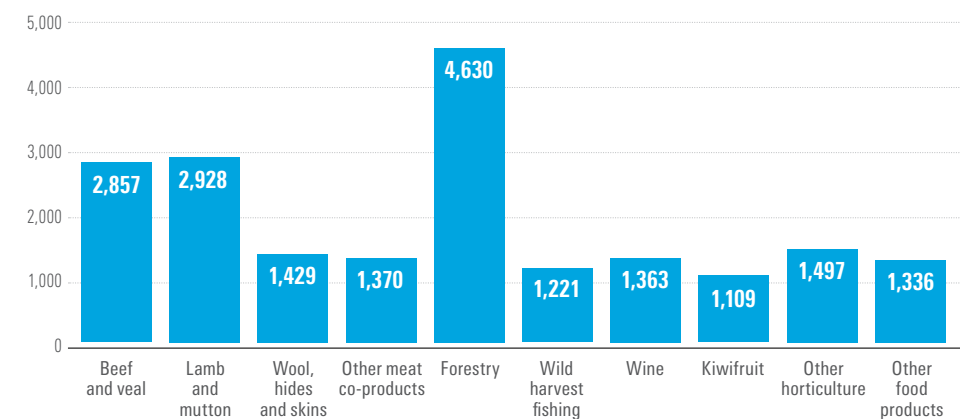
- **New Zealand generates more of its wealth from farming than any other OECD country.** Agriculture is central to the economy and the key driver of GDP through direct product exports and the support industries that enable the industry to function.
- **The New Zealand government has been a strong supporter of subsidy free agriculture since the mid 1980s.** This has left New Zealand farmers with no direct government subsidies and the need to focus on market opportunities to grow income and drive significant productivity improvements across their farming systems.
- **Exposing farmers to the market has resulted in the government achieving some notable landmarks in securing market access.** New Zealand was the first country to secure a Free Trade Agreement with China (2008) and was an originator of the Trans Pacific Partnership negotiations.
- **New Zealand is the largest exporter of dairy products in the world.** In the year to June 2015, dairy will account for around 40% of NZ's tradable exports (2013/14: 47%). Total exports amount to NZ\$35.2 billion, with 10 further sectors generating more than a billion dollars of export revenue.

FIGURE 4: MAJOR EXPORT MARKETS FOR NZ PRODUCTS 2010 VS 2015 (NZ\$MILLIONS)



- **New Zealand is able to produce sufficient food to feed around 40 million people.** This makes it a small producer of food in global terms making it critical that the food grown locks in long term relationships with high value consumers.
- **Auckland is a dominant city, with over a third of the country's population.** As a result of migration, the city is more disconnected from rural New Zealand than ever before, yet the perceptions of its population shapes government policy, including policy related to agricultural and environmental issues.
- **New Zealand farmers have grown the value of primary sector exports by 4.5% CAGR over the last 12 years.** The majority of this growth can be attributed to increases in commodity prices and production volume. Little growth can be attributed to increasing the value secured from the attributes of the products produced, customer relationships, innovation or branding.

FIGURE 5: NZ PRIMARY SECTOR EXPORT PRODUCTS EXCEEDING NZ\$1 BILLION EARNINGS 2014/15 (EXCLUDING DAIRY)



INDUSTRY VALUE GROWTH. CAGR INCREASE IN EXPORTS

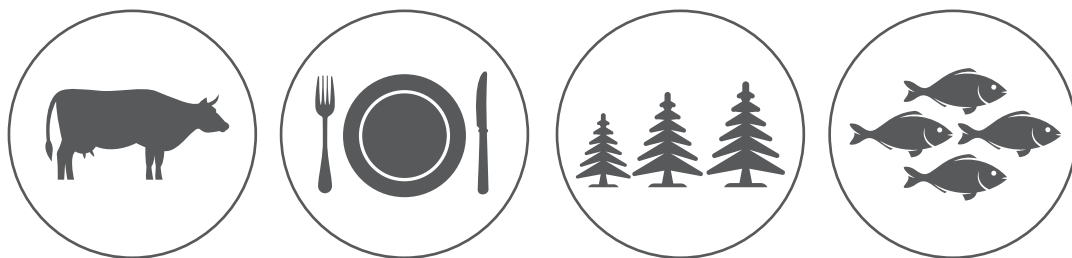
2002–2014 = 4.5%PA

FIGURE 6: VALUE GROWTH FOR NEW ZEALAND PRIMARY SECTOR (2002 TO 2014)

- The New Zealand Government has set the industry the goal of doubling primary sector exports by 2025. It is supporting this goal through investing in the Primary Growth Partnership, a NZ\$750 million research and development programme focused on co-investing with industry partners in transformational export focused initiatives.
- The KPMG Agribusiness Agenda has tracked priorities of industry leaders over six years, with world class biosecurity systems being the top ranked priority each year. In 2015, high speed rural broadband connectivity and developing future leaders rose significantly in priority.
- Delivering safe food and authenticating its quality from pasture to plate needs to be ingrained in New Zealand's primary sector. Recent food scares have put the industry's premium reputation at risk and made farmers view safety as more than just a cost line to minimise.

FIGURE 7: NEW ZEALAND INDUSTRY LEADERS KEY PRIORITIES: JUNE 2015

- 1 World-class biosecurity
- 2 Deliver high speed broadband connectivity
- 2 Strategic importance of food safety
- 4 Deliver market signals to producers
- 5 Sign high quality trade agreements
- 6 Developing future leaders
- 7 Invest in irrigation/water storage
- 8 Deliver R&D incentives
- 9 Innovate with our customers
- 10 Create New Zealand provenance brands

ENVISIONING THE GLOBAL FUTURE FOR FOOD

Our relationship with food is one of the most intimate, personal interactions we have as human beings. As we put food into our bodies, concerns about the integrity, safety and authenticity of the products we eat are significantly heightened. The food choices we make directly influence our long term health outcomes. The choices also reflect our culture, values and economic status and can identify the religion that we follow. They also have a direct impact on the long term environmental sustainability of the planet and its ability to support our ever growing population.

The close relationship between food and daily life means as our lifestyles change and evolve, the ways we interact with food also change in many different ways. As a result, our farmers can't assume the products they have historically produced will continue to be in demand in the future or that current production standards will be acceptable to their consumers.

If consideration is also given to the likely implications of climate change, the increasing connectedness of our society and changing government interventions surrounding food, it becomes clear that there is a pressing need for farmers in Australia and New Zealand to take a deep, strategic look at their businesses to ensure they stay relevant to an increasingly complex global food system.

Much has been written about the mega forces that are reshaping our future global society. These forces will influence the policies that governments implement, the investment strategies that businesses adopt, the lifestyles of individual citizens and the long term availability of critical resources, such as energy and water. It is, however, important to recognise that each of these trends will also have profound impacts on how food is produced, processed and consumed around the world, creating a future food landscape that potentially looks very different to what we recognise today.

The following pages highlight some of the ways we might see radical change in the ways we interact with food in the coming decades.

EVOLVING GOVERNMENT INTERVENTION TO SECURE SUFFICIENT, SAFE FOOD

- For the majority of governments around the world securing sufficient supplies of affordable food for their citizens is a bottom-line policy priority and critical to avoiding civil unrest.
- The cost of subsidising food production has become prohibitive for many governments in the developed world driving significant reforms in programmes to reduce costs.
- The incentives for counterfeiting food or infiltrating the global food supply chain with fake or fraudulent products has never been greater given the demands for affordable food.

Although farmers in New Zealand and Australia largely operate without government subsidies, their businesses are materially impacted by government activities. Environmental regulations, market access arrangements, price controls, country of origin labelling, phytosanitary rules and geographical indicators all shape the markets where farmers sell their products and the prices they can charge.

Both governments provide indirect support to farmers through co-investment in R&D and funding for irrigation and market development initiatives. The Australian government provides subsidised loans to farmers that have been materially impacted by drought and adverse weather events.

Exposing Australasian farmers to global markets has been a key driver of productivity gains. The inability to rely on a government pay cheque has forced farmers to innovate to remain competitive with subsidised producers from around the world. The growth in NZ milk supply provides an example: production has more than quadrupled since producer support was lifted. In contrast Irish farmers, (who produced similar volumes of milk in 1984), have seen little production growth having operated under the Common Agricultural Policy ('CAP') quotas over the same period.

The importance of food to society makes it almost impossible for governments not to interfere in its production and distribution, despite evidence suggesting market direction is likely to drive better outcomes. While

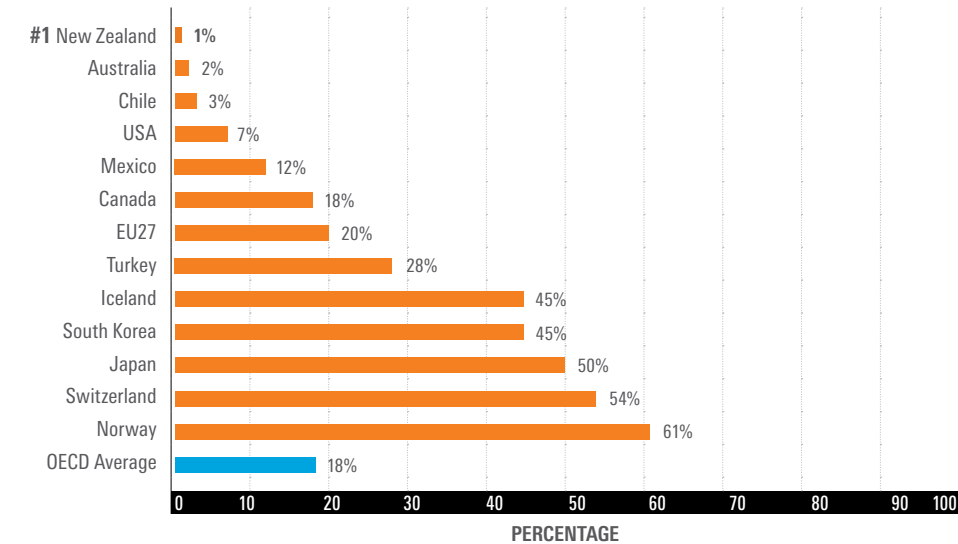
The reality for many governments is that **FAILING TO ENSURE** a sufficient, secure supply of safe food has the potential to **CURTAIN THEIR PERIOD OF POWER.**

administrations in developed countries are focused on reducing farmer support costs, (the lifting of CAP quotas in Europe and US Farm Bill reforms are recent examples), the reality for many governments is that failing to ensure a sufficient, secure supply of safe food has the potential to curtail their period of power.

As a result, many governments will adopt policies to ensure their food supply. Protecting domestic producers through subsidies and tariffs and investing in land and production assets overseas to secure supply are common strategies.

However, the focus is likely to be deeper than just the security of the food supply. Governments are also focused on the safety of the food their communities are supplied with. Numerous food scares, (be it the horse meat issues in Europe, melamine in milk in China, counterfeited branded food or excessive use of pesticides and hormones) have drawn attention to the risks of counterfeit or hazardous foods. As a result food producers have no choice but to invest more extensively in defending their value chain from the farm to the consumer and authenticating the safety of the products they deliver.

FIGURE 8: GOVERNMENTS ARE FACING UNSUSTAINABLE COSTS TO SUBSIDISE FOOD PRODUCERS - % OF FARMER INCOME DELIVERED VIA SUBSIDIES AND SUPPORT PAYMENTS



SOURCE: OECD Library

INCREASING DIVERSITY AND COMPLEXITY OF DIETS AS NEW CONSUMERS EMERGE

- Emerging middle class consumers will express their growing affluence through the food they choose to eat, as their diet enhances their lifestyle instead of being solely for subsistence.
- As the global community becomes more ethnically diverse diets around the world will evolve, incorporating different foods and ingredients, creating new opportunities for farmers in New Zealand and Australia.
- Increasing demand and pressure on supply for animal based products will result in substitutes emerging that will transform the global food system.

With Indian style curries surpassing fish and chips as the preferred meal in the UK it would suggest that globalisation of the world's diet is widespread. Consumers enjoy the excitement of discovering new foods, experiencing new tastes and experimenting with ingredients. The range of products available to consumers grows daily as each ethnic community makes their own contribution to the range of foods available in a country.

There is little doubt that as wealth increases the range of foods that people are able to choose from widens. Most notably, many consumers often increase the amount of animal derived products that they include in their diet, with pork and poultry products seeing the greatest increases, but there are also significant lifts in consumption of red meat (sheep, beef and venison), dairy products and seafood (both wild and farmed fish and shellfish).

The land, feed and environmental challenges of producing significantly more animal protein will constrain the ability of farmers to scale up production to meet demand.

As a consequence growth of demand is expected to exceed the industry's ability to increase supply forcing up prices for many products. This will result in consumers seeking to substitute some or all of their consumption for lower priced, more easily available alternatives.

The increased demand for more complex and diverse foods will drive two transformational trends in how food is produced and consumed.

The first will be wider adoption of alternative proteins as substitutes for lower value uses of animal proteins. A good example of this is the adoption of insects as a source of basic protein, potentially in place of dairy based products, bringing both cost and environmental benefits. This substitution makes sense; insects are incredibly efficient converters of biomass to protein, they have a very limited environmental footprint and if ground become just another powdered ingredient. It also enables dairy products to be directed to higher value uses and reduces some pressure on long term upward pricing trends.

The second transformation is the incorporation of manufactured (or synthetic) proteins into the food supply chain. In recent years we have seen a laboratory grown 'beef-like' burger created by Maastricht University, developments in food printing technologies and much research being done into factory manufactured dairy products. With the growing interest in the sector from venture capitalists, the money is available to rapidly develop these products to the point of commercialisation. Farmers ignore this trend at their peril. To assume that people will not use synthetic products is wrong (sheep farmers made this mistake when synthetic carpets came onto the market), making it critical farmers plan for a dual future and have involvement in both the natural and synthetic sectors of the market.

10 LBS OF FEED PRODUCES...

Cold blooded insects and fish convert feed to body mass more efficiently than birds and animals do.

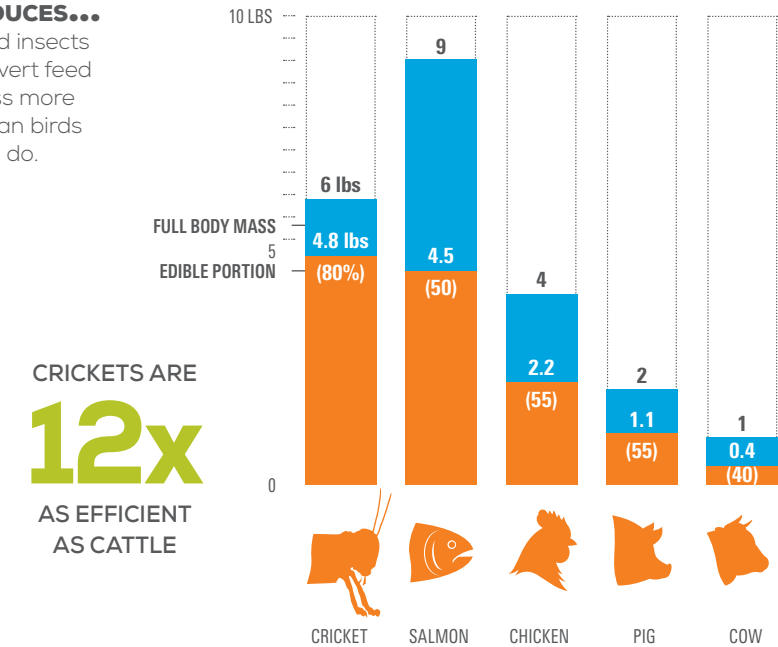


FIGURE 9: DEMAND WILL SHIFT GLOBAL EATING TRENDS AND INTRODUCE NEW PROTEINS TO THE MARKET

DELIVERING TAILORED FOOD ON DEMAND

- Extensively connected technology provides significant opportunities to transform traditional business models and deliver highly tailored products and services to consumers.
- Consumers in the 21st century want access to products when they need them but see ownership as a constraint on their lifestyle flexibility.
- As markets become segmented, food producers need to increase their ability to target products towards particular demographic groups requiring new approaches to manufacturing and marketing.

The emergence of technology enabled solutions that provide consumers with on-demand access to products and services has received significant attention in the last two years. Services such as Uber, Airbnb and Spotify have disrupted traditional business models in their sectors. The disruptors have built flexible businesses based on innovative technology and minimal investment in bricks and mortar, providing immense scope to change direction and tailor solutions to the emerging needs of consumers who often also seek more flexibility in their lifestyles.

The physical nature of food has meant that disruptive business models have taken longer to emerge than in other sectors but it is apparent that consumers are warming

to solutions that provide tailored access to the food they want in a way that aligns with their lifestyle. Time pressured consumers are looking for solutions that can eliminate their need to wait for their food to be prepared or to undertake the supermarket shop by providing only the food they need when they need it. However this represents only the first generation of tailored food business models.

Technology creates huge opportunities to interact with consumers anywhere in the world and tell the story of the food you are producing. It provides a farmer with the opportunity to build their own brand and

interact directly with consumers. Smart use of technology can enable a farmer to set up their farmers market stall on the Internet and become a local food supplier to the world, bypassing traditional retail channels and securing a greater share of the value their products create.

Alternatively, farmers could consider a similar model to that adopted by Philadelphia Cow Share, an organisation that sells proportionate ownership shares in a specific cattle beast to consumers, with the promise of receiving your share of all the meat produced when the animal is processed.

FIGURE 10: E-COMMERCE INNOVATION IN RETAIL INDICATES SIGNIFICANT SCOPE FOR DISRUPTIVE FOOD BUSINESSES



It enables farmers to align themselves with their consumers, provides consumers with greater connection to their food and creates whole of animal value by ensuring all cuts from an animal are valued, not just the premium ones. The overall result has farmers changing the economics of their business and consumers more engaged with the food they eat.

Over the next decade emerging technologies will redefine tailored food. The ability to 'print' a nutritionally balanced meal, designed by a health screening tests conducted at the point of sale, may seem like science fiction but is not far from becoming a reality. The emergence of such technologies will present opportunities for farmers as the ingredients the machines use will still be derived from crops that are grown but will mean that different products need to be cultivated.

DESIGNING FOOD SOLUTIONS TO FIT NEW LIFESTYLE PATTERNS

- The increasing diversity of global communities makes it necessary for a company to look beyond an average consumer and target niche demographics that place greater value on the attributes they deliver.
- The dietary needs of silver consumers, those aged 65 and over, will become a central focus of food producers as the size and wealth of this group grows rapidly.
- As the global population continues to migrate to urban centres, supplying foods that deliver convenient nutrition that fits within the busy lifestyles of consumers becomes a key priority.

Too many companies use market research to ensure they appeal to the average consumer when launching a new product. In reality by focusing on the average consumer there is an increasing likelihood that the product fails

to appeal to any consumer group because it is becoming increasingly difficult to find truly average individuals in our communities. As the world evolves and becomes more diverse, it is possible to segment our communities in many different ways (for example these could include age, ethnicity, wealth, religion, health, education, gender), making it possible to identify the micro niches that product is most likely to appeal to.

The concept of developing a strategy to sell produce into 'China' fails to recognise the diversity and complexity of the Chinese market. An organisation that builds a strategy to target their premium seafood products at affluent, educated and well-travelled consumers in China's Tier One and Tier Two cities has a far greater chance of success. It enables them to better identify the most appropriate partners to work with, ensure their messages are highly tailored and relevant to its target consumers and ensure their ability to fulfil orders is scaled to the size of the market opportunities.

When thinking about food, there are two key demographic groups that stand out as presenting significant opportunities to food producers across the world as a result of their unprecedented growth. Designing solutions that respond to the dietary needs of silver consumers (those aged 65 and over) and the urban population needs to be a central focus for food producers and marketers in the coming decades.

The urban population is expected to grow at around 1.3 million people a week globally between now and 2050. Their needs will shape much of our thinking about food into the future. The amount of time this group will spend cooking will decrease as they spend longer commuting and working. Food habits will evolve in favour of prepared meals and eating out providing significant opportunities to create innovative food service, 'eat on the go' food and ready meal solutions.

FIGURE 11: URBAN AND AGEING CONSUMERS WILL SHAPE FUTURE INTERACTIONS WITH FOOD

	2005	2050
POPULATION SIZE IN BILLION	6.7	9.2
Developed	1.2	1.2
Developing	5.5	8.0
URBAN IN BILLION (%)	3.3 (48%)	6.4 (70%)
Developed	1.0	1.1
Developing	2.3	5.3
ELDERLY 60+ IN BILLION (%)	0.67 (10%)	2.0 (22%)
Developed	0.24	0.4
Developing	0.43	1.6

With around half the people ever to have reached the age of 65 alive today and predictions over 65's will represent 13% of the global population by 2035, understanding the experience food delivers to elderly consumers is critical. Designing products that remain appealing in spite of consumers having potentially less distinct senses, different nutrient and energy requirements and reduced dexterity to open packages or cut food is challenging. Creating highly tailored products requires knowledge and insight not inherent within many traditional food companies, requiring them to collaborate widely to understand consumer issues and design effective solutions.

For farmers, market segmentation means they need to be clearer than ever about who they are producing food for. It is no longer acceptable to disconnect from what happens to their food beyond the farm gate. Their income will depend on how well they connect

to the needs of their consumers and align their farming systems and production to deliver to consumer expectations.

INTEGRATING FOOD INTO A WELLNESS PARADIGM

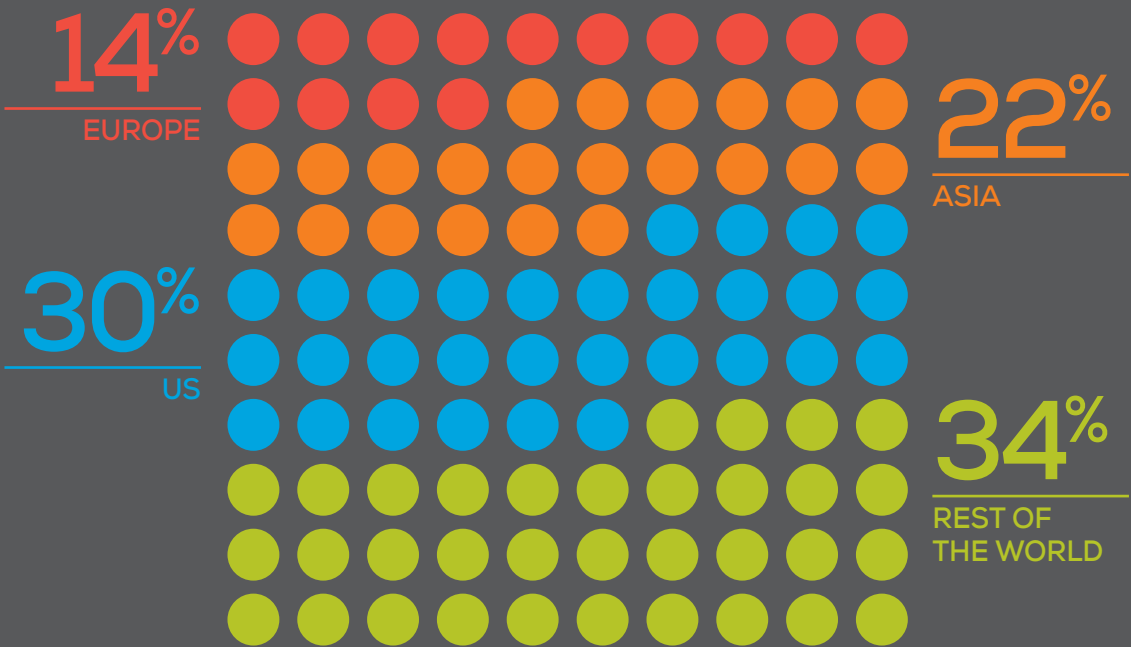
- The cost of healthcare in the developed world continues to escalate rapidly putting pressure on government finances and creating two tier health systems for those with money and those without.
- Governments in developing economies recognise they cannot afford to build healthcare systems that replicate those in the developed world and are consequently directing investment towards prevention of illness rather than cure.
- Food becomes a critical component in promoting wellness in a community, given the impacts that the food and drink we consume have on long term health outcomes.

Over the last century the quest for better and more effective cures for both common and exotic illnesses and diseases has progressed at pace. Ailments that were terminal are now managed; in some cases these have been largely eliminated from our society. However, other conditions continue to emerge and become prevalent, often driven by changes in our lifestyles and the food we eat. Research continues to advance our knowledge of the human body and develop new cures and treatments.

The reality is advances in medical science come at a massive cost. New treatments, while more effective than what was previously available, are often significantly more expensive than their predecessors. This escalation in cost has put significant pressure on the funders of healthcare systems, (traditionally governments and insurance companies), and has challenged health providers to rethink their traditional curative approach to illness.

FIGURE 12: THE NUTRACEUTICAL MARKET IS GROWING RAPIDLY ACROSS THE WORLD

GLOBAL NUTRACEUTICALS MARKET (BY COUNTRY/REGIONAL SHARE)



THE ANNATH US\$250 BILLION BY 2018

It is apparent in emerging economies that healthcare investment is focused towards preventing illness, rather than following the model adopted in the developed world of building extensive hospital infrastructure and investing almost exclusively in curing people once they are sick. The cost savings and community benefits from promoting wellness rather than treating illness are significant. The approach places food at the centre of many wellness initiatives because the quantity and nature of products that a person consumes has a material impact on their long term physical and mental health.

As a result , it is likely that initiatives to regulate agricultural products that are associated with adverse health outcomes will be adopted more widely by governments. For example the restrictions that we already see surrounding the consumption of tobacco and alcohol will, over time be extended with similar restrictions introduced for other products with perceived health risks such as fats and sugars. The measures which could include taxes, prohibitions and constraints on use in particular categories of product will impact on farmers and drive change in what we produce.

We should not overlook that specific foods and other natural products have been used by indigenous communities for millennia for their health benefits. The increased recognition that food is a critical component to long term wellness creates significant opportunities for farmers to create incremental value from the products that they grow by clinically verifying the health benefits of those products, whether they are fruit and vegetables, grains and seeds, meat, dairy or honey. There are opportunities to innovate with the products produced to engineer them with more pronounced health properties and develop tailored nutraceutical foods with specific health benefits, to take advantage of this rapidly growing market.

USING TECHNOLOGY TO GROW MORE FROM LESS

- Growth of the global population together with increasing demand from many consumers for more and better food requires global food production to rise by over 70% by 2050.
- The resources available to produce the food required (land, water and nutrients in particular) are finite and in many cases are declining as a result of urbanisation and climate change.
- Farmers are coming under pressure to change their farming systems to meet the growth in the demand for food while maintaining (or preferably reducing) resource utilisation.

More people, faster urban lifestyles, instantaneous connectivity and greater wealth are realities of our 21st Century lifestyle. As already discussed this creates demand for more and different types of food and places pressure on farmers to deliver on consumer expectations to maintain a stable, functioning society.

The challenge for many farmers is meeting the expectation from society to produce additional, better food while simultaneously being more open about on-farm practices and managing society’s reactions. As consumer interest in where their food comes from increases, it is not surprising that focus is being placed on how farmers are managing their land, water and animals.

Another challenge for farmers is that electoral power lies in the cities and political leaders will design policies that align with the perceptions of their largest constituencies that are more disconnected today than ever to where their food comes from. As governments deliver on the community’s desire to see the environment protected, policies will increase the limits and constraints placed on farming businesses and increase their costs.

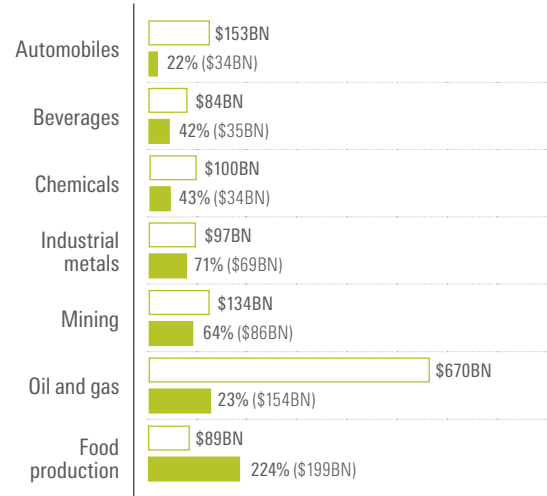
The impacts of such policies could be catastrophic for the primary sector, and for the economies of both Australia and New Zealand. Farmers and other stakeholders in the food production sector need to be far more active in ensuring their stories are heard; telling the wider community about the work that is being done to balance environmental impact with production of sufficient, safe, high quality food that supports our economic wellbeing.

The obligation falls on each and every farmer to design their farm operating system to ensure it minimises its use of natural resources and maximises the food outputs it creates. For many farmers this means that they will need to change what they do and how they do it. However it is critical they do this if they want to ensure they continue to connect with higher value customers who have greater expectations over how their food is produced.

One outcome is that technology, which has historically been a bit part player in most agricultural systems, will take centre stage in enhancing on-farm practices. Whether it is the use of drones to survey extensive areas, precision agricultural techniques utilising

GPS tracking to target water and nutrient application, lysimeters to track run off and leaching, bio-control agents to manage pests, integrated farm management systems or genetically enhanced seed to improve yield (or combat drought), future systems will utilise innovation to a greater extent than ever to enable farmers to verifiably grow more while simultaneously reducing inputs.

FIGURE 13: HIGH UTILISATION OF NATURAL CAPITAL IN THE FOOD AND BEVERAGE SECTOR MEANS IT WILL BE MATERIALLY IMPACTED AS CHARGES ARE IMPOSED FOR USING ENVIRONMENTAL ASSETS FOCUSING ATTENTION ON SUSTAINABILITY INITIATIVES



MINIMISING THE INHERENT WASTE FROM THE GLOBAL FOOD SYSTEM

- It is estimated that throughout the food value chain in the developed world over 30% of the total production is wasted in the processing, distribution and consumption links of the value chain.
- There is significant food wasted across the developing world due to inadequate irrigation, transportation and cool storage infrastructure so food spoils before it reaches the market.
- The average American family buys sufficient food to feed an extra mouth while it is estimated that 800 million people in the developing world are malnourished.

Meeting the future food demands of global consumers presents farmers across the world with a significant challenge, however there is little doubt that part of the solution rests in utilising the existing volumes of food that are already being grown more effectively.

A significant amount of the food produced around the world is never consumed by a human being, but lost prior to reaching the consumer through processing losses, supply chain delays and retail inefficiencies. There is also a significant amount of post-consumer wastage, through families and restaurants buying and cooking more food than they need to satisfy necessary dietary requirements resulting in a lot of food going directly to landfill.

Eliminating food wastage from the global food value chain is a commendable goal, although total elimination of waste will be incredibly difficult to achieve within any foreseeable time period. Therefore the focus for the industry needs to be on the quick wins that are available to ensure a greater percentage of the food produced globally

is eaten by consumers. If it is possible to reduce food waste globally by a quarter between now and 2050, then the expected 70% increase in production over the period will likely result in 92% more food becoming available to meet the nutrition needs of the global community.

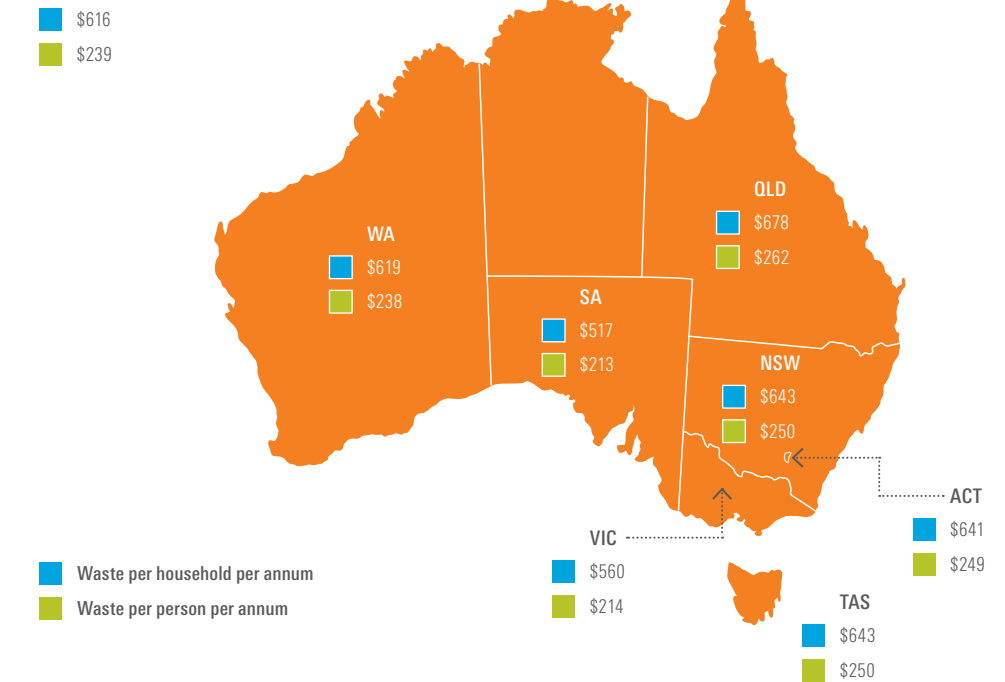
So what do the quick wins look like and how are they likely to be achieved? There are many opportunities, particularly in the developing world, that can be realised by applying supply chain knowledge that already exists in the developed world to ensure that more product is edible when it reaches the consumer. This can be as simple as improving the design of cartons used to transport products to market through to making targeted investment into cool supply chain infrastructure so that product is consistently handled at temperatures to ensure it is safe and the risk of spoiling is minimised.

The major impact that small improvements in waste minimisation can have on the total food available globally will see governments becoming more proactive in this area. It is reasonable to expect that governments in the developed world will invest in R&D projects that ensure more of the food grown reaches the consumer. It is also likely they will seek to ensure more of the food is actually eaten with legislation already being introduced in some countries implementing measures that outlaw supermarkets from disposing of still edible food (France being a recent example). Restrictions are also likely to be placed on the calorie content of meals to reduce the amount of cooked food wasted while also improving community health outcomes.

Farmers will be expected to play their part, with increasing focus being placed on how their production is handled on farm which is likely to add cost to the farm but reflects their key role in a plate to pasture value chain.

FIGURE 14: FOOD WASTE IS A SIGNIFICANT PROBLEM IN OUR REGION INCREASING THE LIKELIHOOD OF REGULATION

COST OF FOOD WASTE IN AUSTRALIA



NEW ZEALAND'S \$872,000,000 FOOD SCANDAL

NATIONALLY
WE WASTE
\$872
MILLION A
YEAR ON
FOOD THAT

AS A NATION WE THROW AWAY

122,547

TONNES OF FOOD PER YEAR

THE AVERAGE FAMILY WASTES
\$563

WORTH OF FOOD PER YEAR
THAT'S 3 SHOPPING
TROLLEYS FULL



CREATING FARMING SYSTEMS TO FEED A PROSPEROUS FUTURE

As the way that food fits into the lifestyles of consumers around the world evolves, the ability of farmers in Australia and New Zealand to continue farming as they always have will come under increasing pressure. The products they have grown and the systems that have been employed to deliver production growth and financial returns over the last century will not guarantee continued success into the future.

As a result farmers will have to change. This may mean they need to change the farming systems they use while continuing to produce

the same or similar products. For other farms to remain economic, farmers will need to change the products they produce; this may be in response to the market evolving but it could also be driven by shifts in the regulatory environment, water availability or land ownership.

It is likely that regions will see their productive capacity change as a result of climate change; some regions will lose the ability to cultivate their traditional products while opportunities will emerge for other regions as their climate becomes more conducive

to growing higher value products. At the same time, technology is emerging that has the potential to transform the productivity of farming systems with the benefits an individual farmer derives being driven by their willingness to integrate innovation into their organisation.

There is little doubt that the capability of farmers in Australia and New Zealand to efficiently produce high quality products places them in a sweet spot in a world looking for more food. However, it cannot be overlooked that even the combined production from Australia and New Zealand meets only a tiny fraction of the total global demand for food, highlighting the need to focus on quality if the industry is to be successful in growing the value it generates. Supplying differentiated, high quality products overcomes any lack of scale and secures a position of relevance to consumers.

There are countless opportunities available to farmers to grow greater value and create a more prosperous future for themselves, for their communities and for their country. However, there is a risk that the opportunities available are not fully realised through apathy, a lack of capability, capital constraints or regulatory limitations and a one off opportunity to reposition farm businesses across the region as high value food enterprises is lost.

The future direction, and prosperity, of the farming sector will be determined by the mind-set adopted by those in the industry; how they make themselves relevant to their consumers and the culture they look to build within their businesses. Those that recognise the opportunities available beyond the farm gate and realise that leading a farm business is an increasingly complex management position (integrating scientist, engineer, personnel manager, accountant, environmentalist, marketer, educator and labourer into a single role) will prosper.

Life will become increasingly difficult for those that continue to farm solely as a lifestyle choice; regulation will constrain their freedom to operate and any unwillingness to keep up with the pace of innovation on productivity and the environment (due to a lack of capital and capability) will place increasing pressure on their financial viability. While this will mean that some traditional farmers abandon their lifestyles and cease farming it should not be assumed that there is no longer a role for the family farm. On the contrary, it is likely that the passion many families have for their land, combined with the compelling purpose of securing the family's future may see many family farming organisations evolve into the sector's future powerhouses.

In the end each farmer will determine the direction for their business. Those that recognise the future and embrace change will position themselves to realise greater value from a global food system that will function very differently by 2050. The following sections explore some of the choices facing farm business owners in the coming years as they seek to maintain their relevance to consumers and secure a sustainable premium for the products they grow.

The **PASSION MANY FAMILIES HAVE** for their land, combined with the compelling purpose of **SECURING THE FAMILY'S FUTURE** may see many family farming organisations evolve into the sector's **FUTURE POWERHOUSES**.

SECURING THE LICENSE TO OPERATE

Community focus on how food is produced has amplified significantly in recent years. At the same time, the number of people with understanding and empathy for the day to day realities of farming has fallen to historically low levels in our modern communities. Farmers have expressed frustration at the focus being placed on their operations, suggesting that they often feel like they are farming a fishbowl.

Many people in our society only get exposure to the primary sector when something has (or is perceived to have) gone wrong and the story hits the headlines; whether it be the alleged mistreatment of sheep by Australian shearing gangs, the claims of dirty

dairying levelled against New Zealand dairy farmers, concerns raised over the welfare of animals being exported or food safety protocols trigger a scare (be it in milk, meat or berries). As a result community perceptions of farming practices are significantly out of touch with reality in the majority of cases. This has consequences on the regulatory frameworks and limits being imposed on a farm business's license to operate.

The steps that each farmer takes to engage with the community and deliver to their expectations will ultimately determine how many constraints are imposed on their license to operate into the future.

BUILDING BRIDGES WITH URBAN CONSUMERS

Immigration and urbanisation have left most Australians and New Zealanders with no family connection to a farm; most children no longer have the opportunity to spend time on farm to understand where their food comes from. The image of the stereotypical farmer is perpetuated by the media, without reference being made to the complexity of the businesses they run. The food and agricultural sector attracts a disproportionate number of activist campaigns (predominately around environment, food safety and animal welfare issues), but does little to tell its story. Farmers have to proactively build bridges with urban communities so they understand more about food production but also the contribution farmers make to economic wealth. Good news stories on environmental protection or innovation do not deliver headlines that sell newspapers; farmers need to cut through the noise of modern society and engage directly with the wider community to take a lead in preserving their license to operate.

DOING THE RIGHT THING BY THE ENVIRONMENT BECAUSE IT IS THE RIGHT THING TO DO

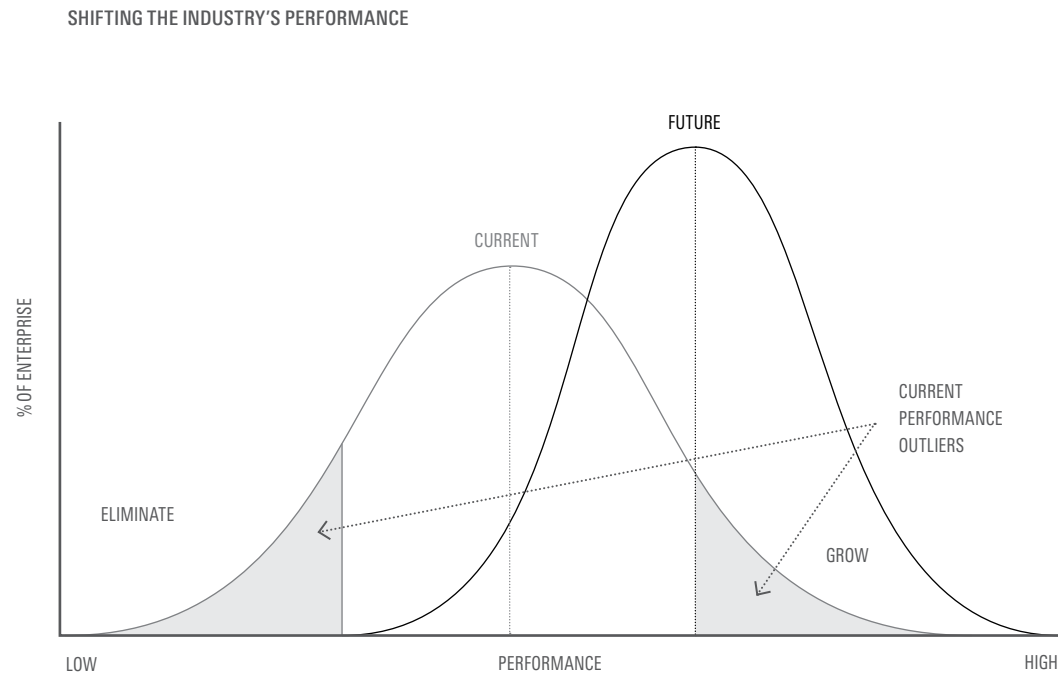
There has been a shift in environmental conversations; it is now acknowledged that every farmer needs to do the right thing by the environment as it only takes one mistake for the whole industry's reputation to be brought into disrepute. The preservation of the environment has become a bottom line for many in our community, increasing the focus on providing clearer guidance to farmers on what are the right things to

do. However, just following the rules is not enough for farmers that have aspirations to compete globally. The culture within the industry needs to evolve to recognise that investing in initiatives that safeguard or improve ecosystem diversity or water quality has to be done because it is the right thing to do, not because a rule says it has to be done. Using the environment sustainably needs to become instinctive to farmers to protect the license to operate and meet the increasingly stringent requirements of customers around the world.

FOCUSED EXTENSION TO SHIFT THE PERFORMANCE CURVE

The speed of innovation in agricultural technology and production systems means the performance gap between the strongest farmers (generally those that understand and adopt innovation into their farming systems quickly) and the weakest performers has grown significantly. The challenge is that the weakest performers present the greatest risk to the wider industry's license to operate; it is the weaker farmers that are most likely to be associated with environmental failings and attract adverse headlines to the industry. It is critical that the industry invests in farm extension to shift the performance curve, reducing the risk of environmental failure and enhancing the sustainability of more farmers across the sector. The challenge is to design an extension scheme that secures wide involvement; weaker farmers are the least likely to engage in structured programmes so the focus needs to be on working with those who do participate. This will ultimately see the weakest farmers left behind and leaving the industry.

FIGURE 15: MULTIPLYING BEST PRACTICE TO SHIFT INDUSTRY PERFORMANCE



CONSTRUCTIVE PARTNERSHIPS WITH REGULATORS

Traditionally many farmers have viewed regulation as an operational inconvenience, increasing cost without delivering any benefits to their business or the community. As customers place more focus on the farming practices that underlie the production of their food they seek robust assurance that their food is being produced in accordance with the standards they expect. This creates opportunities for farmers to build constructive partnerships with regulators, be that national,

state or local government, to develop legislation that secures the interests of the wider community, while also authenticating production standards for customers. This has the potential to make regulation an enabler of profit rather than a constraint on flexibility but it requires farmers to proactively work with regulators and the wider community. Acknowledging the concerns of the community and developing collaborative solutions that secure outcomes that balance the interests of all stakeholders supports a very powerful story to secure a price premium in market.

PRODUCING MORE WITH LESS

There is an inherent inconsistency in the expectations held by many people in our communities. They expect sufficient, safe, affordable food to be available and rely on access to basic social services (such as roads, schools and hospitals) yet they expect these products and services to be delivered without any erosion of the country's environment. The lack of connection between the consumption of natural capital to produce food and create wealth (which ultimately funds basic social services), has highlighted a crucial consideration for farmers; the need to produce more food while continuously striving to reduce the environmental impacts of their activities.

For most farming businesses this converts to a simple, challenging equation; as inputs into the farming system reduce the food outputs need to increase.

Effectively producing more while reducing the levels of inputs employed in a farming system requires flexibility to be ingrained into business culture. Recognising that there is always opportunity to do things better and continuously seeking out and experimenting with new technologies requires time and commitment. The most successful farming businesses will be built on an aspiration to operate the best farm in the world, meaning they will consistently seek better ways to operate their farm systems. The leading farmers of the future will year on year produce more while reducing the inputs into their systems.

Agricultural activity in many regions is largely **INFLUENCED BY HISTORY**; what is **GROWN TODAY** is often produced as it has been **GROWN FOR DECADES**.

BEING PREPARED TO CHANGE LAND USE TO GROW LONG TERM VALUE

Agricultural activity in many regions is largely influenced by history; what is grown today is often produced as it has been grown for decades. Consequently many farmers are not using their land optimally to maximise their production or wealth. Farmers can increase the value they realise from their land by thinking more strategically about the products they cultivate. They need move beyond the 'it's what we do around here' mentality to focus on the attributes of their land (the climate, soils, water availability and market connectivity) and the evolution of markets to make strategic decisions around their production strategies. Patterns of consumer demand are changing, as is the climate, increasing the need be open to a better opportunity. It is a big call, often requiring significant investment, to transform a farming business, however for many farmers following a new direction will provide the opportunity to grow greater value in future.

ADAPTING TO FARMING WITHIN RESOURCE CONSTRAINTS

Necessity has forced many farmers to become attuned to maximising their farm productivity within boundaries defined by resource availability. This is particularly apparent in drought prone regions of Australia, such as the Murray Darling Basin, where water availability has influenced many farming decisions. The global demand for food is placing pressure on natural resources; constraints key food purchasers globally (the large processors and retailers) are very aware of and integrating into their purchasing standards criteria. Farmers need to recognise this trend and incorporate these expectations into their working practices so they are able to farm within these limits, even if their land is not subject to the same resource constraints. As a consequence, a farmer on the West Coast of New Zealand (with significant annual rainfall) needs to be as careful with water in their farming system as a dry land farmer in Australia. Failure to deliver on consumer expectations could result in farmers losing their ticket to supply the highest value markets around the globe.

RECOGNISING THAT DOING THINGS THE SAME WILL DELIVER THE SAME RESULTS

Habit defines much of what is done on many farms today; farmers are comfortable drawing on the practices that have served them well historically to respond to an event rather than adapt to an innovation that is available. Instinct is a critical attribute of a successful farmer, but in a dynamic world relying solely on instinct is unlikely to maximise production. The trouble with following history and doing the same thing time and time again is that the results are likely to be similar each and every time. There is constant innovation in the agricultural sector and significant potential productivity gain is lost each and every year as a result of innovation not being adopted by farmers. High performance operators increasingly recognise that their business is improved by supplementing their farming instinct with comprehensive data analysis to determine the most appropriate course of action. They understand their business is dynamic and seek out relevant information, recognising that it is likely to deliver better results than doing the same as last year.

RESPONDING TO COMMUNITY CONCERNS ABOUT INTENSIVE FARMING SYSTEMS

Globally, the intensification of farming systems has been proposed as a response to the imposition of environmental and other production limits. Intensive systems, which often involve housing animals indoors, enable farmers to exert greater control over the inputs into a farming system and to manage outputs, such as effluent, in an environmentally sensitive way. However, there is significant disquiet amongst

urban consumers over the perceived industrialisation of agricultural and in particular, the housing of animals. Concerns are expressed over animal welfare, the ethical and sustainable sourcing of feed stocks used in intensive farming systems and, increasingly, the use of antibiotics to manage disease in confined environments. Despite scientific evidence suggesting that the modern intensive farming systems employed for example, in the dairy, pork and poultry sectors provide better environmental and animal outcomes than traditional pasture based systems, consumer unease about these systems is deep. Urgent innovation is needed to develop intensive farming systems which deliver on consumer desires to see animals grazing outside while preserving the production and environmental benefits inherent in housed systems.

TECHNOLOGY ENABLED AGRICULTURE

Agriculture has been slow to adopt digital technology, however this is changing as a wave of investors (and their venture capital) join traditional agricultural technology companies seeking solutions with the potential to disrupt all stages of the food value chain. These investors committed US\$486 million of funds to agri-tech innovation during 2014, focusing on areas including precision agriculture, indoor and devolved agricultural systems, food safety, alternative and novel foods and on-farm robotics.

Much of the innovation is coming from start-ups, often motivated by a social purpose to enhance access to nutritious food, as much as profit. They look at using connectivity, the integration of data and new perspectives to address intransigent challenges the global food system has failed to resolve over many decades. They seek to unlock significant increases in production of the foods consumers want to eat and ensure that it is edible when it reaches their table.

It is unlikely that any single innovation will transform the global food system; however the sheer number of innovations being pursued will deliver a collection of tools that farmers can use to transform their business. The extent and speed of change is hard to comprehend today, so many of the potential game changers are little more than concepts currently, however farmers will be faced with a stark choice: join the disruptors or face disruption themselves. Technology enabled farming systems have become a reality for the majority of highly performance farmers.

DELIVERING HIGH SPEED RURAL CONNECTIVITY TO DRIVE PRODUCTIVITY

Connectivity is key to ensuring the technology becoming available is able to be utilised on farm. This presents a significant challenge; construction of high speed broadband infrastructure is expensive and the economics rarely work to enable its rollout to rural areas where the intensity of use does not deliver a return on investment. However, without connectivity the ability to utilise data to make better farming decisions to improve production, environmental and economic outcomes will be lost. In reality, the benefits of connectivity extend well beyond the farm gate, making a significant contribution to developing strong rural communities by supporting education, healthcare and social interaction. Farmers need to recognise this and partner with councils, utility companies, processors and exporters to develop innovative economic models that enables the benefits of the agri-tech era to be captured within their business.

MAINTAINING A MATURE CONVERSATION ABOUT OUR BIOTECH FUTURE

There are many views on the future role of biotechnologies in farming systems. The divergent regulatory environments surrounding genetically modified organisms in the region illustrate the spectrum of views; Tasmania, South Australia and New Zealand have bans on the use of GMO's while cultivation of commercial crops is permitted in Western Australia, NSW and Victoria. Globally there was 181.5 million hectares planted with GMO crops in 2014. The European Union devolved GM decisions to member states. The Bill and Melinda Gates Foundation, and other organisations are making philanthropic investments into GM technologies, including golden rice, that have the potential to transform food availability in developing countries. GMO's will significantly influence the global availability of food; the need for ongoing, science led conversations around the use of these technologies is critical to set policies that balance community concerns, economic opportunity, scientific knowledge and environmental protection to maximise the value farmers realise at their farm gate.

INTEGRATING DATA INTO ON-FARM DECISION MAKING PROCESSES

In any business the best decisions come from combining experience with relevant, timely information. Historically, farming businesses have had limited access to timely information, however that is changing rapidly with new applications being developed that capture, analyse and interpret data to support decision making. While a wealth of data is

becoming available, the challenge lies in the fact that much of it is delivered in autonomous data streams that provide a range of often inconsistent recommendations. There is real potential to create value in farming systems by delivering consolidated insights to farmers derived from all the data their farm generates. Conveying such insights relies on the broad collaboration of application suppliers to build an open access platform that enables data streams to be integrated and powerful recommendations developed. The potential to transform farm productivity is massive. The risk, as is often the case, is that individual companies focus on their self-interest rather than think more widely about what is best for their customers.

USING TECHNOLOGY TO DEVOLVE FOOD PRODUCTION INTO URBAN REGIONS

Technology has the potential to transform our understanding of what a farm is. Remotely controlled micro farming units, urban roof farms and aquaponic barges (floating farms that combine hydroponic horticulture with aquaculture) all have the potential to devolve agricultural production into urban communities, shortening the supply chain and increasing the availability of fresh food. It is likely social enterprises will take a lead in developing these farming systems, motivated by a desire to provide better access to quality food to disadvantaged communities. They will present a challenge to existing farming businesses as they are likely to substitute production from traditional forms of agriculture (in particular, horticulture) requiring existing farmers to continuously assess their role in the value chain.

RECOGNISING THE ROLE OF INTERGENERATIONAL INVESTMENT IN SCIENCE

A key driver in the dramatic growth in New Zealand's dairy sector over the last decade has been the investments made during the 1970's and 80's in researching pastoral farming systems; these have delivered cost and productivity advantages making New Zealand farmers globally competitive. The farmers that funded these intergenerational investments made a huge investment in the future of the New Zealand, however there is concern that insufficient long term investment is being made to support the next generation to take similar transformational steps forward. The challenges of climate change and evolving demand for more and different food make it critical, that intergenerational research takes place to secure the future of farming in Australia and New Zealand in the long term.

The challenges of **CLIMATE CHANGE** and evolving demand for more and different food make it critical, that **INTERGENERATIONAL RESEARCH** takes place to **SECURE THE FUTURE OF FARMING** in Australia and New Zealand in the long term.

ATTRACTING TALENTED PEOPLE TO THE FARMING SECTOR

A modern farm is a highly complex business and a farm owner or manager requires working capability in a wide range of capability areas, from financial risk management, through employment law, environmental regulation to social science and animal welfare. The future of farming relies on attracting intelligent young people into the industry however many of the best and brightest continue to walk past the sector without giving the career opportunities it offers a second thought.

While the primary sector requires people with a wide range of talent and skills, the widely held belief amongst young people (and their careers advisors) remains that farming jobs are largely physical and unskilled, involving anti-social hours in remote and often unconnected locations. There is an urgent need for the true nature of farming career opportunities to be more proactively promoted in both Australia and New Zealand, together with the levels of remuneration (which are above average in both countries) and the longer term potential to take an ownership interest in a business.

Articulating a vision for the future of farming based on environmental respect, innovative technology and **PARTNERSHIP WITH THE WIDER COMMUNITY**, together with the ability to bypass the lifestyle challenges inherent in cities, **CREATES A PATHWAY FOR PEOPLE** who have never given a second thought to a career in agriculture.

CREATING ASPIRATIONAL CAREER PATHWAYS

The diversity of farming activities (and the sector's supporting industries), mean there is big demand for people with diverse skills and capabilities to deliver on the industry's growth potential. It would not be too far from the truth to suggest that whatever career path you wish to pursue, there would be a challenging work opportunity available in an organisation connected with the primary sector. Engaging more extensively with schools and universities to ensure farming as a career option is presented in a balanced and comprehensive manner provides a longer term solution to workforce availability. However, the demand for people is more pressing than the timeline on securing students from schools. There is a real need to promote career opportunities to people that have previously walked past or not considered the primary sector more effectively. Articulating a vision for the future of farming based on environmental respect, innovative technology and partnership with the wider community, together with the ability to bypass the lifestyle challenges inherent in cities, creates a pathway to attract people who have never given a second thought to a career in agriculture.

INVESTING IN TRAINING AND DEVELOPMENT

Historically, training on a farm took the form of the chosen son often completing a multi decade 'apprenticeship' under their father before being passed the baton to take on the business. Today, with the next generation of the family less likely to take on the farm, the need to adapt traditional approaches to developing farm workers and leaders has come to the fore. The need to formalise training and ensure farming is perceived as a true profession, has become pressing as the burden of regulation and compliance has changed and deepened the skills set an individual needs on farm. As already noted the industry's license to operate depends on each and every farmer doing the right things to avoid operational failures. This makes it critical that farmers are clear on what are the right things to do as well as how to react when something goes wrong. The case for a mandatory continuing professional development system continues to build, with strong arguments it would safeguard the industry's license to operate into the future as well as attract people into farming looking to build a professional career.

SELLING THE DREAM: OPPORTUNITIES FOR BUSINESS OWNERSHIP AND LEADERSHIP

While it may be a throwaway line, there remains some truth in the claim "that the fastest way for a kid in New Zealand to become a millionaire is to get into dairy farming". While, the extent of the investment required has grown and the time to accumulate the equity to achieve farm ownership has extended, the beauty of the NZ dairy sector is that there remains many hundreds (if not thousands) of ambitious young people currently working towards their dream of full farm ownership through share-milking and equity partnership arrangements. The ability to present a career option that has a pathway to business ownership differentiates a farming career from most other opportunities and is appealing to young people. The obvious stumbling block for the millennial generation is that the road is long, twisty (even switching back on occasion) with no guarantees of success at the start. However farming needs people prepared to take a long term perspective and build for the future; the industry should be active in selling the dream of ownership to attract aspirational young people.

CREATING STRONG AND RESILIENT RURAL COMMUNITIES

The rural lifestyle is integral to many farming jobs. Despite earlier comments about the devolution of farming systems into urban centres, the reality is that the majority of roles will remain rurally based. In Australia, in particular, this can mean that a new employee could potentially find themselves hundreds of kilometres away from their nearest neighbours let alone a town. Remoteness is a deterrent that prevents people considering a farming career, however strong, vibrant, connected rural

communities can help to overcome this and attract talented people to jobs in the wider primary sector. Ensuring that people are able to access health and education services of a similar quality to those offered in urban areas reduces the barriers to relocation. However, key to building resilient communities are the informal support networks that are built to welcome newcomers to the community, assist them with settling in and offering support when times get tough, which is a reality in the volatile world of agriculture.

ACCESSING LONG TERM INVESTMENT

Today's world presents Australian and New Zealand farmers with a plethora of opportunities as producers of high quality food, fibre and timber. Many farmers, however, lack the necessary capital to take advantage of the opportunities that offer the greatest potential to deliver value. All too often the tendency is to take the first opportunity that comes along, particularly if it comes with a partner prepared to invest in the necessary infrastructure (be that tangible or intangible) to realise the opportunity; after all a 'bird in the hand is better than two in the bush', isn't it? The speed at which the global economy has evolved over the last decade has highlighted

the need to think very strategically and do the due diligence to identify the best partners for a business. Very often these will not be the first group of potential investors that walk through the door. The inherent volatility in agriculture, the length of growing cycles of many plants and animals and the time taken to build brands, progress research or develop an irrigation scheme make the industry long term in nature. Farmers and land owners have traditionally taken long-term approaches in thinking about the investments they are making in their farming business, often thinking in generations rather than years.

Successful investment relies on a strong cultural fit between the parties and similar expectations around the lifetime of the investment to ensure value is able to be created, captured and ultimately realised. The growing recognition of the global protein story has created a wave of new investors, often with very large cheque books, increasing the need for farmers to think carefully about how they fund their business and partner beyond the farm-gate in the future.

BUILDING CAPACITY TO HANDLE VOLATILITY

Volatility, whether it comes from the weather, biosecurity, currencies, commodity prices or any other factor is inherent to agriculture. Whether it is one season in seven that has the potential to be catastrophic (as is often suggested) or it is entirely random (when the unexpected hits), the farmers that will fair best are those that have built capacity into their businesses. Capacity can come from retaining a cash reserve in the good years or the approach taken to debt levels in the business. However, it can also revolve around establishing governance and risk management processes within the business (often as a counterweight to an enthusiastic owner operator) or the investment made into people with the aptitude to instinctively respond in a crisis. Whether it is the major droughts that have impacted parts of Australia, cyclone strikes on Northern Queensland banana plantations, the Psa outbreak in the New Zealand kiwifruit sector or the recent collapse of the global dairy price, the ability of a farmer to weather the volatility and their capability to recover depends largely on the capacity they build into their business before the crisis. Given volatility is inherent, farmers need to be proactive in building capacity to ensure their survival.

REDEFINING THE FUTURE ROLE OF AGRICULTURAL CO-OPERATIVES

Co-operative societies have been a cornerstone of the development of the primary sector in both Australia and New Zealand; they have given farmers the opportunity to collectively invest in their product's value chain beyond the farm-gate. Despite the formative role co-ops have played in the primary sectors of both countries, there are now questions over the long term future of the model, particularly because traditional societies are struggling to raise the capital they require to capitalise on higher value market opportunities. Meeting changing customer needs makes it more critical than ever that farmers are connected to their customers and engaged in the post farm-gate value chain. Co-operatives remain a vehicle to facilitate such investment but it is critical they are clear about their purpose and understand what their members expect them to deliver, so a structure can be designed to deliver on this purpose. Many organisations are exploring the creation of hybrid structures that integrate external capital into the co-operative (through joint ventures or investment share categories) to fund growth and enter new markets.

Despite the **FORMATIVE ROLE CO-OPS** have played in the primary sectors of both Australia and New Zealand, there are now **QUESTIONS OVER THE LONG TERM FUTURE** of the model.

NEW INVESTORS, NEW EXPECTATIONS

Emerging wealth in the middle class populations of markets like China, India, Brazil and Nigeria has attracted investors who have historically shied away from the agri-food sector. The inherent volatility of agriculture and the challenges this presents to reporting consistent quarterly numbers led many fund managers to steer a course well clear of the industry. However, the food story has attracted new investors and their money, based on an expectation that demand growth will underwrite steady growth in asset values. For farmers this is a positive; the greater interest in the sector helps support land values and, for those prepared to work with an external investor, can deliver the capital to develop their farm and step change productivity. The money also brings expectations, particularly around business profitability and the generation of cash returns; historically farmers have been asset rich and cash poor, farming for long term capital gain rather than cash. However the need to pay dividends is focusing farmers on the strategies needed to operate a cash generative farming systems.

BUILDING COLLABORATIVE PARTNERSHIPS WITH OFFSHORE ORGANISATIONS

Changes in the Australian foreign investment rules (the reduced threshold for oversight of foreign acquisitions of agricultural land from A\$252 million to A\$15 million) highlights the growing recognition of the strategic importance of agricultural assets to Australia. The policy shift in Australia brought regulatory oversight closer to the New Zealand regime, where agricultural land purchases over five hectares are subject to review. Despite tightening oversight, both

governments recognise the opportunity that long term offshore investors bring to the industry, offering not only growth capital but market knowledge, consumer connectivity, brand equity and further processing capability. While the farm can never be moved offshore, the political (and wider public) concern is that once the farm is sold off and production streamed into low value products to be further processed offshore, the potential for the industry to grow its contribution to the wider economy is lost. Encouraging collaborative long term partnerships offers the potential for win-win solutions; with farmers retaining an interest in their land while gaining significant benefit from involvement in the value chain beyond the farm-gate.

GROWING WHAT MARKETS ARE LOOKING FOR

Most countries struggle to produce sufficient food to meet the needs of their domestic population. Farmers in both Australia and New Zealand produce significantly more food than their domestic demand; consequently the industry has had to identify export markets to realise value for the additional food it is able to grow. In practice these markets have been developed, often through agents or distributors, as a clearance channel rather than to supply products that meet the specific needs of the consumers that ultimately eat the products that we produce.

As a result the products sold from this region have predominately been sold in commodity formats with the distributors and retailers, who own the ultimate consumer relationships, having the opportunity to capture more of the value available from the produce our farmers grow.

To command a premium farmers need to address the key challenges associated with food that exist in the lifestyles of the people that ultimately consume the food they produce. To be able to solve these problems you need to understand them. A significant

proportion of the excess food produced can be redirected from commodity to higher value channels by delivering tailored solutions if the farmers get closer to their consumers. They need directly, or through their marketing partners, to invest in building intimacy with their customers, understanding their lifestyle challenges and then developing innovative solutions to solve the most significant of these challenges.

INVESTING IN BOOTS ON THE GROUND

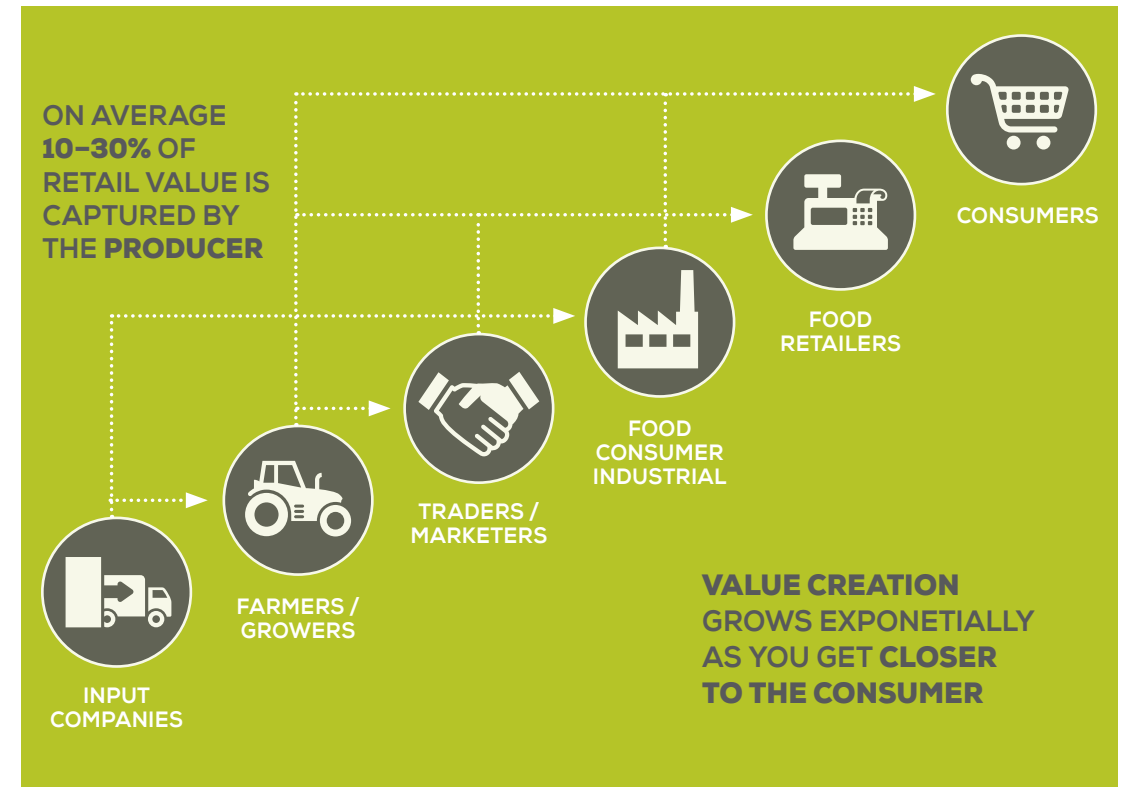
A farmer with a desire to see their farm-gate return grow can no longer detach themselves from what happens to their product as it finds its way to its ultimate consumer. The consumer wants to understand where their food has come from and what has been done to it during its journey to their plate, starting from how and where the product was grown. As a consequence every farmer needs to recognise that consumers (or their alternates , the retailers and food manufacturers) are assessing them against a series of environmental, ethical and quality standards before deciding whether to pay a premium for their produce. These standards are not static but continuously evolve driven by social media trending, fashion, economic wealth, religious decrees and regulation. To keep up with these expectations it is critical that farmers get clear signals back from the market and respond to these. The reality is that this can only be achieved by embedding people into key markets to walk in their customers shoes every day. While investment in market insight may feel intangible to many farmers it is critical to securing and growing high value markets.

BUILDING BRANDS AND TELLING OUR STORIES

Historically, primary sector branding has involved designing a logo and printing it on the box with the hope that it would drive higher sales volumes and values. Branding has moved on and now must articulate to the consumer the experience they can expect to receive when they use a product or service. Brands have become integrally linked to the consumer's perception of an organisation (Apple being the ultimate example of experience branding). As a result what happens on farm becomes central to the value proposition presented to the consumer by the primary sector. The ability to tell a story about how a product is grown adds depth and authenticity to a brand story. If you can talk not only about the various attributes of the product but the people that have grown it, their heritage and values, their natural environment and what they are doing to enhance it and their focus on securing the safety and integrity of their produce, consumers can build a greater connection with the producers of their food. Farmers that live their brand have greater potential to capture additional value for their products.

The ability to **TELL A STORY** about how a product is grown **ADDS DEPTH AND AUTHENTICITY** to a brand story.

FIGURE 16: REALISING THE VALUE REQUIRES CLOSER CUSTOMER CONNECTIVITY



STRATEGIC INVESTMENT ALONG THE VALUE CHAIN

Value is not captured proportionally along the value chain; the more connected you are to the consumer of the product the greater the ability to capture more value. Retailers have used their customer connectivity to manage access to consumers and secure a significant share of the value a product creates. This should concern farmers. On average only 10 to 30% of the retail price of the product comes

back to the farm-gate, with many of the large sectors in Australia and New Zealand being at the low end of that range. Farmers can capture more of their value by participating more actively in the value chain beyond their farm-gate. Historically, this has been done via the producer co-operative, and more recently by connecting directly with customers through farmers markets. Technology provides opportunities to build direct connections with larger numbers of potential consumers and transact with them directly. However being

noticed in a busy eCommerce marketplace remains a challenge for the farmer going it alone. Willingness to collaborate with other farmers to offer a basket of products or with established market participants to secure positioning, has the potential to return more value to the farm-gate.

ORGANICS AND NATURAL PRODUCTS

For many farmers adopting a strategy to produce organic or natural products is central to their efforts to capture more of the value created by the products that they grow. In theory, people should be prepared to pay a premium for products that are grown more sustainably. However the evidence is mixed as to the extent of any premium that is achieved and whether it compensates for the yield reductions that can occur when growing organic products. There is an argument that consumers, particularly in premium segments, expect products to be grown sustainably and are not prepared to pay more than they already pay for high quality, safe food for organic and natural products. There is certainly a market niche for certified organic products, however it is volatile as was highlighted during the GFC when consumers deserted the segment in favour of lower priced products. The challenge for farmers targeting this sector, and few are yet to crack it, is establishing how to consistently secure a premium to justify the higher costs and lower yields associated with growing natural and organic products.

CREATING SOLUTIONS FROM CO-PRODUCTS AND SERVICES

For many farmers there is an opportunity to realise greater value out of their farming system by thinking more holistically about the potential to utilise all aspects of production to generate income streams. In some cases the co-product opportunities are obvious and have been pursued for decades; for instance realising value from bobby calves in the dairy sector or creating tourism services such as farm stays (or even the Hobbiton set tour which is run alongside a farming business in the Waikato region of New Zealand). Farmers are recognising, for both environmental and economic reasons, that it makes no sense to waste any opportunity to realise value. As a result they need to think more creatively about all aspects of their farming system. This could entail exploring how effluent or waste biomass can be utilised to create energy, integrating forestry stands, honey bees or goats into production systems to improve environmental outcomes and creating new revenue streams or developing solutions to realise value from products that have historically been seen as waste (for instance lower grade fruit and vegetables that have historically gone to feed stock).

Farmers are recognising, for both **ENVIRONMENTAL AND ECONOMIC REASONS**, that it makes no sense to waste any opportunity to **REALISE VALUE**.

Farmers that are able to **ADOPT THE MIND-SET** of a start-up enterprise and become comfortable with continuously introducing innovation to their business are most **LIKELY TO BE SUCCESSFUL**.

ATTRIBUTES OF THE FARM OF THE FUTURE

The future of farming, like many other sectors, is one of constant change. Farmers that are able to adopt the mind-set of a start-up enterprise and become comfortable with continuously introducing innovation to their business are most likely to be successful.

Close connection to the ultimate consumers of the products grown is critical to recognising how social interaction with food is evolving

and identifying the transformational opportunities likely to enable greater value to be captured at the farm-gate.

So what do farmers need to do achieve this ambition? What can national, state and local governments do to facilitate the transformation of the farming sector into a high value food sector?

The future of farming will be shaped by farmers and those supporting the industry being prepared to:

- **ACCELERATE** the pace of change within farming businesses. Doing the same as always is likely to continue to deliver the same outcomes. As markets, the climate and technology evolves it is critical farmers are open minded in considering how their land is utilised and the technology applied in their farming systems. Change is inherent in the modern world, farmers need to adopt a start-up mentality and embrace it.
- **COLLABORATE** with partners with similar goals and aspirations. Recognising that the power of many can achieve better outcomes faster than individual effort is critical. Government agencies, competitors, industry bodies, suppliers, customers and the wider community are all potential collaborative partners depending on the aspiration. As small players in an evolving global market there should also be greater collaboration between Australian and New Zealand organisations.
- **COMMUNICATE** regularly and willingly. Consumers want to understand how their food is produced and what happens to it before they eat it. The community seeks assurance over how the environment is being managed. Trust is built by open communication about issues and the actions taken as a result. Confidence comes from great stories about the innovation and investment being made across the industry to create sustainable wealth for the economy.
- **EDUCATE** people about the career opportunities available in farming. Farming is not sexy and too many talented people walk past a career in the sector without even recognising their may be an opportunity available for them. Farmers need to ensure that they are presenting a career path to young people, including continuous professional development, to equip them to lead (and potentially own) an increasingly complex farming businesses in future.
- **EVALUATE** key decisions utilising credible, real time data. Collecting relevant data from a farming system, integrating the data to identify trends and utilising the results to support decision making will enhance the quality of decisions. Using data can improve productivity and enhance environmental outcomes, however professional judgement, intuition and experience is still critical to interpret the data and authenticate the credibility of recommendations made.
- **INNOVATE** continuously to capitalise on disruptive technologies. Technologies are continuously emerging across the food value chain to improve farming, processing, logistics and consumer experiences. Farmers need to recognise that adopting innovation in their own farming system, as well as encouraging their value chain partners to do the same, is critical to delivering on consumer needs and securing a position of relevance in the global food system.
- **INTEGRATE** fully into the value chain. Farmers are a critical part of the plate to pasture value chain, they need to understand the customers that are eating the food they produce, how they use their products and what more they need. They need to invest in getting into market more and participate along the value chain to capture more of the value available from the products they produce.
- **REGULATE** the industry to protect the social license to operate. The ability to continue to farm relies on every farmer doing the right thing every day and as a consequence it is critical there is a clear articulation of what the right thing to do is. Clear regulation defining standards that meet the expectations of the community and consumers, provides assurance over how food is produced and creates the opportunity to realise value applying world class standards.



The primary sectors in Australia and New Zealand need a big vision for their future, particularly as their role in global food systems is likely to evolve rapidly.

IAN PROUDFOOT, GLOBAL HEAD OF AGRIBUSINESS KPMG

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