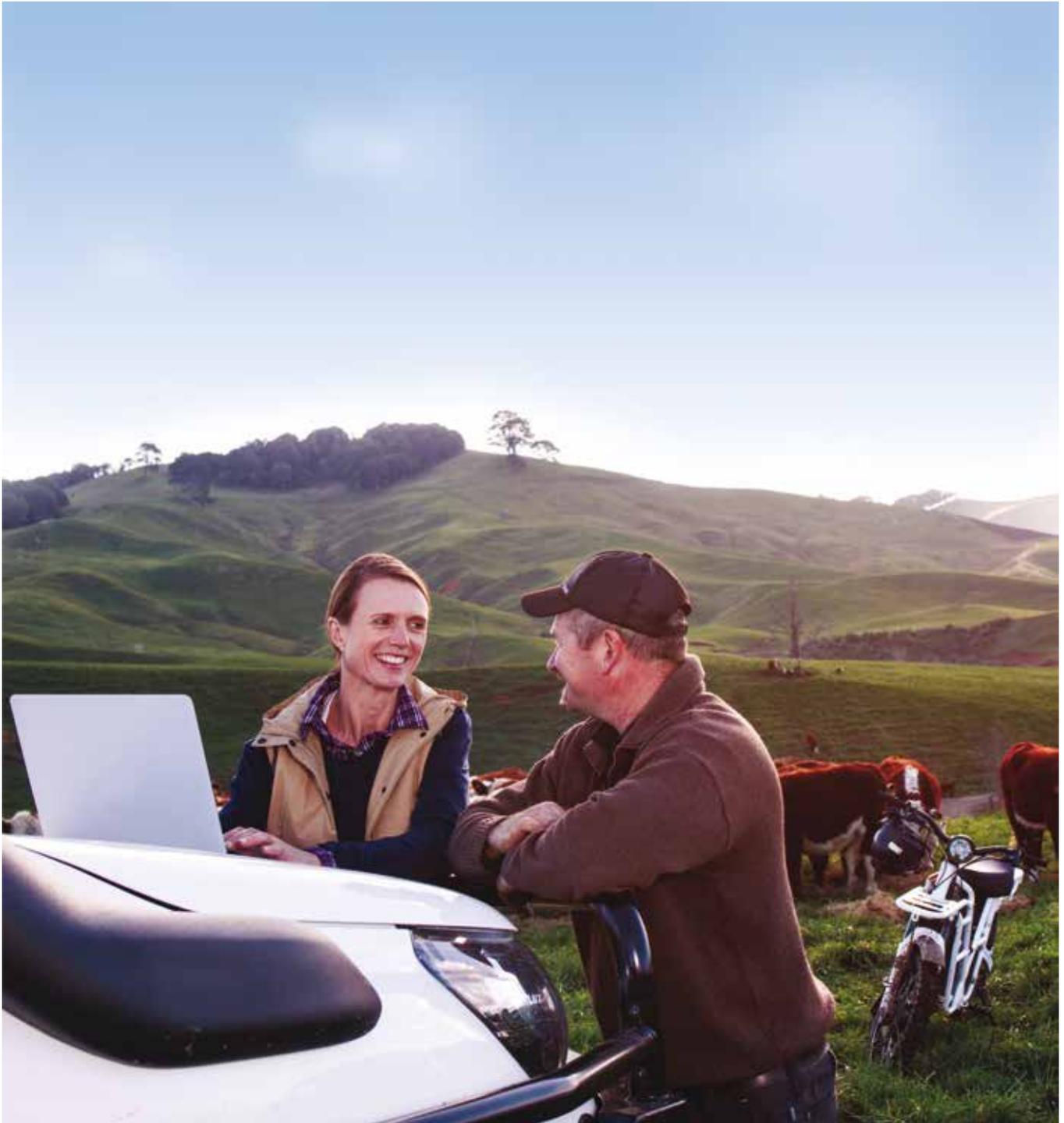


# THE JOURNAL

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**SUPPORTING CLIENTS AFTER NATURAL DISASTER** THE BEEF CONUNDRUM **STOCK WATER RETICULATION ON HILL COUNTRY** REVIEW OF MILK PRICE RISK MANAGEMENT TOOLS **THE GROWING GARLIC INDUSTRY**  
ALTERNATIVES TO MEAT AND MILK PRODUCTS



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Ministry for Primary Industries  
Manatū Ahu Matua



# THE JOURNAL

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# Are alternative proteins setting the pace in understanding consumer needs?

Everywhere you look at the moment there is some kind of commentary or reference to the potential threat to our traditional industries from alternate meat or milk proteins. Growing environmental, ethical and health concerns are often cited as the main reasons for increased interest in these types of products, particularly among supposedly discerning and health-conscious consumers. Even as you read this you are probably thinking not another one, so please bear with me.

Let us consider alternative meat proteins. There are strongly-held views by industry commentators that alternative meat products derived from plant-based products or grown in petri dishes pose no threat to the meat industry. As the argument goes, how can alternative meat proteins possibly threaten the position of naturally produced meat products on the basis of the large array of ingredients and refined processing techniques required to produce these proteins?

I am sure this argument provides sufficient comfort from which to carry on as we have always done and ignore the possible challenge from alternate meat proteins. But this is cold comfort from my perspective, particularly when you consider the significant level of investment and research effort that is going into the development of alternative meat proteins to mimic the attributes of naturally produced meat products.

The wave of new food manufacturing techniques will continue to get better and better, to some point in the future where alternative meat proteins could potentially become indistinguishable from the real thing. So what does this all mean for the meat industry?

In a recent Rabobank report titled *Watch Out ... Or They Will Steal Your Growth!* it notes that the market for alternative protein products will be much smaller than that of the animal protein market over the next five years. It goes on to say, 'however, it is not the total market size, but the growth rates that alternative protein products are witnessing – and are expected to continue seeing – that is the most significant.'

Within the report it notes that alternative proteins have the potential to steal a material share of the growth in animal protein consumption in the EU over the next five years, and is expected to represent one-third of total protein demand in the EU. Whilst a slight increase is expected across the United States (2%) out to 2022, Rabobank expects stronger demand growth to occur on the west coast of the United States and in parts of the north-east, as well as in certain metropolitan areas.

The future consumption of alternative meat proteins is expected to increase among consumer groups that actively choose not to consume animal products, and potentially price sensitive groups that are apathetic in their selection of protein sources. Manufacturers and marketers of alternative animal proteins have been very successful in tapping into changing consumer food preferences, and are creating new markets for themselves to meet such demands once the domain of a small group of vegetarians and vegans.

So how well do we know our consumers in being able to meet their future needs and expectations?

The millennial generation (individuals born between 1982 and 1996) is shaping and transforming the food industry as both discerning consumers and active participants within it. As a generation that grew up with the internet, they freely and frequently share their thoughts and buying habits via multiple social media platforms.

Millennials are said to have ethical stances on issues and are conscious of the impact of their food choices on society and the environment. They also expect the companies they deal with to be engaged, transparent and authentic, which has seen a move to purchase locally produced foods and a shift away from big brands.

A recent study by Chicago-based CBD Marketing of more than 12.5 million social media posts and other online commentaries by millennials largely substantiated many long-held assumptions about their food and beverage consumption and shopping habits. And as simple as this is – being environmentally-conscious was seen as 'hot', and lack of transparency is 'not'.

To meet the expectations of current and future consumers about our environmental credentials, transparency of supply chains and ethical obligations on animal welfare and employment practices, we need to better articulate and engage in platforms that communicate directly with our consumers, as well as with individuals considering careers in the primary industry. But to do this well we need to lift our game in developing a deeper understanding of their views of the world and food protein purchasing behaviours in the future, which could be surprisingly and radically different from what we expect or can even accommodate.

I hope that you have enjoyed reading *The Journal* this year. The Editorial Committee continue to have healthy debate and discussion in identifying topics that we hope you find interesting and relevant to the rural profession and the wider primary industry. The Editorial Committee is always open for readers' feedback on future topics for *The Journal*. **J**

SHARON MORRELL

HOW RURAL PROFESSIONALS CAN  
BEST SUPPORT CLIENTS AFTER A

# NATURAL DISASTER

Floodway near  
Edgecumbe,  
7 April 2017

Regional DairyNZ staff have had the opportunity to serve clients facing a range of extreme challenges: from earthquake, to snow, to flood and wind damage. Many of those affected are still trying to return their lives and their businesses to some form of normalcy, some more than a year since the disaster. Looking at the lessons learned can help other rural professionals know how to best serve clients caught in such upheavals.

## Rural adverse event cluster groups

When is a walk down a farm with a client to discuss their feed situation and make decisions about taking stock off the farm not really a feed assessment, but a listening and observation exercise? When they have just milked with a generator, have a car with hazard lights parked on the road because a power line is dangerously low, cows bunched at the front of a handy paddock, and less than half the farm has been grazable for a week.

Some of us are great in a crisis, some of us probably don't really know. Most of us, though, are less than perfect and need help to get through. Often, we as rural professionals can provide that help to clients. Around the country now, in most areas, some form of rural adverse event cluster group is (or is about to be) operative. These cluster groups are comprised of members from organisations that already have been (or could be) involved in an emergency response situation in a rural setting.

They are oriented around Coordinated Incident Management Systems (CIMS) structures and processes,

the same system used by all New Zealand emergency management organisations. Many rural service organisations are now taking up this way of working, getting at least key personnel CIMS trained. Knowing who is in control and how the structure works provides confidence and allows each to focus on doing their own job effectively. This way of working also ensures that what are essentially limited workers for servicing a rural area in crisis are able to be employed most efficiently, and directed to where the needs are highest first.

## Kaikoura experience

Responding as part of a coordinated team is the best place to start. When the Kaikoura earthquake struck on 14 November 2016 a drought response network already existed in North Canterbury. At that stage there was no emergency response-oriented rural adverse event cluster group. For DairyNZ, in this instance the drought network was activated readily by a phone call from our Canterbury Regional Leader who had a ready contact list to initiate an effective crisis response. This early activation was

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## Early establishment of the level and extent of damage is vital information, not only to ensure each person gets what they most need quickly, but also for triggering the necessary support from government agencies.

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essential, but those involved agree that with their new knowledge of CIMS priorities and processes an even more efficient needs assessment and response would have been possible.

Feedback from farmers affected by the Kaikoura earthquake has been that in the early days there were too many different people coming up their driveways. They were all well intentioned, checking what their company or service organisation could provide, or perhaps gathering information to help shape the overall response. However, those in the disaster zone had to focus energy on caring for themselves and simply doing what was necessary to get through each day.

### Eastern Bay of Plenty experience

The 'multiple visitors' feedback became a strong imperative during the response to not one, but two, cyclones within a week in early April in the Eastern Bay of Plenty. There the Ministry for Primary Industries (MPI) and the local Rural Support Trust were insistent that contact with affected farmers and others should be well coordinated. This meant that information for Civil Defence and those assisting with the rural response was gathered through one contact point. Again disaster struck prior to the establishment of the local rural adverse event cluster group, although this has since been activated.

The rural response was at least linked to the Civil Defence response by MPI and key others. The rural hub focused on matching offers of grazing with stock needing evacuation, feed offers and needs, flood pump management, and linking concerns about wellbeing with a friend or the Rural Support Trust. Apart from the Trust, those involved included Federated Farmers, Fonterra, DairyNZ, many individual farmers (some with flooded properties themselves) and other local rural professionals. The make-up and activities of this group varied over time, but the aim was the coordination of farming needs and support that aligned with the overall Civil Defence response. With the collective knowledge of the local geography, infrastructure and people, a stock-take could be made and those at highest risk were contacted first.

### Establish extent of damage

Do not assume that because this is a certain kind of disaster that you know what any farming family needs – ask them. To best find out the genuine needs of each one affected they first need to know that help is available and that their needs are as deserving as anyone else's. It is important to tell those affected that you are working

as part of a coordinated process. Give them confidence in what is happening in the background when all they may be able to see are the large and genuine problems. It is important not to accept an, 'I'm okay, there are others in a worse situation.' Instead, ask for a description of the damage, of the farm operations affected or disabled, of the situation, followed by a list of what things they may need help with and what they can manage themselves. This should give a clear picture of what that farmer really needs.

Early establishment of the level and extent of damage is vital information, not only to ensure each person gets what they most need quickly, but also for triggering the necessary support from government agencies. Usually asking those same questions of both partners gives a fuller picture of both the situation and their needs. Given the gendered structure of many New Zealand households, it is important to ask women about her family's need, or else she may be the one to ring three days after her husband has said they are fine to say they have run out of infant milk formula. Since this is a time of pressure and dealing with many urgent tasks, it is wise to phone and make an appointment to see your client at a time that suits them. You will be less likely to be told they do not have time to see you, compared to just turning up at the house.

### Stock needs

Organising the movement of stock is a top priority. Many will be familiar with Maslow's hierarchy of needs, with survival imperatives such as shelter, food and drink forming the base (and non-negotiable) foundation of the pyramid. For a farmer, the survival and well-being of their livestock can take the priority of urgency over their own. Evacuating farmers from areas under imminent threat can be difficult if they feel their stock may be endangered, or even left unfed for too long. Having a plan for the stock that the farmer can have confidence in can be a key to them taking the step toward their own safety. Helping clients to decipher the urgent from the important and set up (and maybe reset) a simple action plan is valuable at many stages in the response to recovery journey.

Even once the 'danger' has passed, the decision to remove stock from their own care is a fraught one for many farmers, and not always readily agreed by both parties of a farming couple. In the Eastern Bay of Plenty, we had the situation of a rush of stock needing to be evacuated from farms significantly flooded by the water that swept first through the township of Edgumbe. About 3,000 were shifted over a couple of days. When



*Rangitaiki River at Te Teko, 13 April 2017  
(note plastic wrap in trees)*

the second cyclone brought severe winds and caused widespread power outages, this became the straw that broke the resolve of many to continue to the 'proper' end of the milking season and about another 2,000 animals were moved at that stage.

One couple came to the attention of those of us coordinating the rural response and a visit was made to help them come to a decision about moving stock or battling through with them at home. Less than half the farm was grazable, but there were facilities for off-paddock feeding. This was the walk down the farm mentioned at the start of this article. A walk that was useful, not so much to make an accurate assessment of the feed situation, but to hear that one of the partners was resigned (even keen) to have the cows leave, allowing them to make a clean break to prepare both themselves and the property for the new season. Finances did not demand they continue milking, but making the call to shift the animals 'away from their control' may have felt like giving into the buffeting that nature had dished out.

An objective conversation with an outsider enabled the two to come to agreement that their own well-being was the highest priority and that suitable grazing out of the area would be a useful step toward achieving that. It is worth recognising that decision-making capacity can be severely compromised for those who have experienced

the trauma such disasters cause. Also never underestimate the value of that third voice, or perhaps just a third ear, in helping to align the two vital pillars of most rural New Zealand businesses, especially in a time of crisis.

That ear can be a vital support to those who are carrying a lot of the weight of assisting their own communities. Our Southland Regional Leader contacted one such farmer to gather ideas from him about what to do, and who to visit, during a flood response. This farmer was playing a key role, providing a level head at the community meetings, of which he attended all. When he dropped in for a coffee, our Regional Leader realised that this farmer desperately needed someone to debrief to himself, and the quick coffee became an hour and a half of listening and support. This was an 'aha moment', recognising that we must not neglect those who seem most capable.

#### **Take care of rural professionals**

Similarly, it is vital not to neglect your own wellness. Working in an emergency context is not a rural professional's usual situation, unlike A&E staff for example who deal with stress every day. Discipline is required to set clear personal boundaries and attend to your own wellness habits, including eating well and getting rest. When you take a break from the response effort, even if it is short, it should be absolute. You will not be

**Rural professionals are skilled at uncovering alternative solutions. This is a great skill to bring to a set of conditions that are less than perfect and may be far from normal. Farmers may come up with some of the ideas and you will be an excellent third party to test them with.**

indispensable, especially in a coordinated CIMS process. Work with your colleagues, or fellow responders, because with them you may both find a listening ear to unload to and even be that listening ear.

#### Alternative solutions

Rural professionals are skilled at uncovering alternative solutions. This is a great skill to bring to a set of conditions that are less than perfect and may be far from normal. Farmers may come up with some of the ideas and you will be an excellent third party to test them with. Ask questions that accurately evaluate risks and priorities to help your clients work outside the handbook, while still avoiding the 'worst thing'. Decisions about effluent, for example, can be taken out of a farmer's hands when their pond is full of floodwater and even the higher ground effluent irrigation area is saturated.

Beyond the immediate response much pragmatism is required to work through decisions in an imperfect setting. Dead pasture has to be replaced, even if it is well past the usual 'latest' sowing date. Weighing up a trade-off between what would normally be two non-negotiables may be necessary. For example, is it better to accept a lower cow condition score at calving or have lower average pasture cover? Bear in mind, however, that different clients will have different emotional responses to the choices they face and the solution for one may not be best for another.

#### Long road to recovery

Once the urgent tasks have been dealt with the long journey of recovery stretches ahead. This may be an opportune time to reassess whether your client's goals and priorities have changed. It may no longer be appropriate, or even desired, to go back to the old normal. Following that, ask yourself if you are the best person to assist, or should you help them make a connection with someone better suited to their specific needs. While it can be hard to give up the business, clients recognise a referral that has been made in their best interests and will likely become a strong supporter, if they were not already. Do ensure, at whatever stage your client is at – from crisis, to response, to recovery – that any referral loop is complete.

#### BE PREPARED

Back to before the start. There are three things you can do before the start of a disaster:

- Help clients prepare themselves
- Prepare yourself with some awareness of mental health
- Link in with your local rural adverse event cluster group.

Work with clients in this area of risk management to establish an adverse event plan. We all need to face the fact that we operate in a country that is prone to a variety of such events. Every farm has its own geography, infrastructure, power supply options and so on. Ask questions such as:

- How could they get water to stock?
- How could they milk the cows?
- What are the emergency feed options?
- Where are the contact numbers when the cell phone is dead?

This is too vulnerable a time to find out some time later that the person you referred them to did not provide the service expected.

Recovery is usually an unknown journey. For one severely flood affected farmer in North Waikato, re-sowing over 80% of the farm in late April and May presented an uncertain future. He took quick action and arranged to totally destock the farm through winter and into spring, expecting he might not be able to have the place fully restocked until late October. Our North Waikato Regional Leader worked with others in the DairyNZ feed team to model the new grass growth rates and effect on pasture cover. They produced a feed budget that suggested the farm would be ready for some of the stock by early September. As the winter and spring have progressed, the farm's recovery has been even better than anticipated.

From the farmer's feeling that late October would be 'the time', to the Regional Leader and his team calculating around three-fifths of the stock back by early September, eventually came the reality. With good growing conditions, and the unanticipated effect of so much winter active pasture, the farm is easily coping with close to the whole herd at time of writing. This example shows two things: the value of obtaining some expert advice; and the significance of monitoring and adapting a plan, especially one that deals with lesser known conditions.

Keep checking in on your client's recovery – for longer than you think. For many people, some of the effects of a disaster only become apparent after a year or so. Again it is as simple as asking about their situation, reminding them that it can be a rocky journey, and asking what they need now. You may be just the right person at the right time with the right question to validate a decision, provide a solution or to simply encourage.



Rangitaiki River at Te Teko, 6 April 2017

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**Keep checking in on your client's recovery – for longer than you think.  
For many people, some of the effects of a disaster only become apparent after  
a year or so.**

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About a metre of snow in August as calving was getting underway last year at Taharua and Rangitaiki drove just such a review on farms there. Do not underestimate how much work cows do feeding themselves on pasture. Having to manually provide an alternative takes effort, the right gear to match the feed reserve and many hours in a day. One farm has included provision for more supplementary feed than a normal winter would warrant. Another farmer with a second farm at a lower altitude has purchased a generator that can be shared between the farms. They have also ensured they have the right connection installed to get it going without having to call an electrician, and stored it up at the higher-risk farm.

**Good mental health**

There are several ways to lift your own capability in assisting others to have good mental health. GoodYarn farmer wellness workshops help participants recognise and respond appropriately to friends, family, farming colleagues or customers suffering from stress. Mental Health 101 is another good introduction to this.

Connect with your local Rural Support Trust, MPI or DairyNZ staff member to find out if a rural adverse event cluster group is functional in your area. It may or may not be appropriate to be an active part of the group, but at the very least have an old-fashioned list of key contacts and phone numbers in your car and office.

In summary, start before the beginning to prepare yourself and your clients. Be part of the coordinated response with organised resources and plans. Ask the right questions of the most at-risk people early to find out needs, considering the whole family, not just one member. Neglect neither those who seem capable, nor yourself. Help with decisions to establish priorities. Monitor and adapt the plan to manage uncertainty during recovery. Finally, check in with how they are doing for longer than you think.

The extent of cooperation, service and creative problem-solving at times of crisis can be profound – and an honour to be part of.

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PHIL JOURNEAUX AND ERICA VAN REENEN

# ECONOMIC EVALUATION

## OF STOCK WATER RETICULATION ON HILL COUNTRY

This article reports on a study investigating the costs and benefits of installing a stock water reticulation scheme on hill country. It also discusses the non-economic benefits the farmers perceived, and illustrates the clear benefits a water scheme can provide.

### Motivation for installing a scheme

This article reports on a study undertaken through the middle of 2016, its purpose being to analyse the economic returns (in an investment sense) from installing a reticulated stock water supply system on a hill country farm.

The study was based on a case study approach, where 11 hill country farms across the country were visited (twice) and their systems analysed as to costs and returns. All had essentially changed from a natural water supply system of creeks and streams, plus (mostly) dams with variable water quality and reliability, to a reticulated system of good quality, reliable water.

The motivation behind installing a reticulated water scheme varied. Many of the farmers stated their main reason was because the current stock water system was inadequate and limiting production. Many also cited problems with dams – water quality was poor, they often dried up in dry periods, and rescuing stock stuck in the dams was a constant job.

All of the farmers noted issues with the impact of drought, often resulting in areas of the farm which were ungrazable due to no water, and saw providing a reliable water supply as a means of combating this. Many wanted to better graze hill country areas and saw better water supply and sub-division as critical to achieving it. Some farmers also wanted to finish more animals and recognised the need for good water to achieve this.

### Costs and benefits

The analysis was based on calculating the net present value (NPV) and internal rate of return (IRR) over a 20-year period using a discount rate of 8% real.

### Capital costs

Capital costs incorporated into the study included:

- The capital costs of the water scheme, e.g. pumps, tanks, pipes, troughs, etc. It also included costs involved with any earthworks, the installation of the scheme, construction of any dams or weirs, and machinery costs. All the farmers had been directly involved in the installation, so their time and any machinery used by them was also included as an opportunity cost.
- Increased sub-divisional fencing. All but one of the case study farmers had increased the number of paddocks as a direct result of the water scheme, so the capital cost of this was included.
- All the case study farmers had altered stock numbers and/or stock type as a result of the water reticulation and increased sub-division. A number had purchased in stock directly, with this cost incorporated as part of the capital cost of the water scheme. Many farmers though had increased/altered stock numbers by breeding up, i.e. increasing their retained replacement numbers. In this case, a capital cost of the increase/change in stock was calculated using a five-year average (2012-2016) of the IRD Herd Scheme values.

**All of the farmers noted issues with the impact of drought, often resulting in areas of the farm which were ungrazable due to no water, and saw providing a reliable water supply as a means of combating this. Many wanted to better graze hill country areas and saw better water supply and sub-division as critical to achieving it.**

## All the case study farms had shown an improvement in profitability via increased stock numbers and/or improvement in stock performance.

- Salvage value. Inasmuch as the water scheme and increased sub-divisional fencing would still exist at the end of the 20-year investment period, a salvage value was included, being the original capital cost depreciated at IRD rates over the 20 years. Similarly, any increased stock numbers would still exist and their salvage value was the same as the original capital cost.

### Operating costs

Operating costs included in the analysis were:

- Repairs and maintenance (R&M). Most of the schemes were relatively new and as such R&M costs were relatively low, with most relating to either pump costs and/or trough fittings. An assumption was made to include R&M costs at 1.5% of capital costs, excluding labour, capital stock and machinery costs. Also, on the basis that R&M costs could be expected to increase as time progressed the costs were inflated at 1% per year across the 20 years.
- Electricity or fuel costs for the pumps. This varied throughout the year, generally higher in summer and lower in winter (as expected). An annual average cost was used in the analysis.
- Insurance. Some farmers had specific insurance on the scheme so this cost was included. For many, insurance was included in their general farm insurance plan so no additional cost was included.
- Additional fertiliser. A number of farms are applying additional fertiliser as a result of the water scheme/increased sub-division/increased stock numbers.
- Additional supplementary feed. Similarly, a number of the farms had either increased the amount of supplement made on-farm, or purchased in, as a result of the increased livestock or different livestock being run.

All the case study farms had shown an improvement in profitability via increased stock numbers and/or improvement in stock performance. The general sequence of events leading up to the improved stock numbers/performance was:

- Installation of the water reticulation scheme, followed by
- Increased sub-division, followed by
- Better grazing management, followed by
- Improved pasture utilisation, and/or better pasture production, followed by
- Improved stock numbers and/or performance.

A key driver of the productivity gains was the sub-divisional fencing, which allowed for better grazing management. The benefits of sub-division are well known, although one of the case study farms did not increase sub-division, but still increased profitability through better grazing management. While it is somewhat chicken and

egg-ish about the provision of water and sub-division, sub-division was not possible until water was provided for in each paddock, and in discussion with the farmers they agreed that water reticulation was the pre-requisite for further sub-division.

### Benefits

The benefits that arose were:

- Change in stock numbers. Any increase or decrease in stock numbers was calculated and a standardised gross margin applied to these changes. In many instances, farmers had decreased sheep and increased cattle numbers, although this was not universal.
- Changes in lambing and/or calving percentages and in numbers sold prime versus store. In many cases, farmers had improved their lambing and/or calving percentages post the water scheme (due to better feeding) and were selling a greater proportion of animals prime rather than store.
- Increased slaughter weights. In many instances, farmers were finishing stock to greater weights than pre-scheme. In these cases, the additional weight was valued via the average schedule and multiplied by the number of stock involved.
- Opportunistic stock finishing. On a few farms the new water supply, coupled with the additional sub-division, has opened up the opportunity to trade or finish additional stock depending on pasture supplies.
- Saved costs. Prior to the reticulated scheme many of the farms had relied on dams as a major source of water. These were maintained/cleaned out on a regular basis, either annually or through to five-yearly. With the advent of the reticulated scheme, many of these dams were destroyed and in all instances the maintenance on them was ceased. The cost of this now ceased maintenance was included as a saved cost.
- Lessened the impact of drought. All of the farmers noted that the installation of the stock water scheme had materially benefited the farm during periods of drought through either being able to carry stock for longer and/or continue to graze most of the farm, whereas in the absence of the scheme large portions of the farm were often not grazable, especially for cattle. Given the wide variation between the case study farms, this benefit was incorporated into the analysis via two proxy benefits:
  - an assumption of a 'dry' period every fifth year, where the benefit was equivalent to 10% of the five-year average net farm profit for either North or South Island hill country (Beef + Lamb New Zealand data), and
  - a more severe drought every 10<sup>th</sup> year, where the benefit was equivalent to 20% of the five-year average net farm profit for either North or South Island hill country.



Diesel-powered pump at the back of the farm



Break tank half-way down the hill

This 'benefit' is not in the sense of increased income in those years, rather it is in the form of a saved cost. In discussion with the case study farmers, many felt that the above proxies actually undervalued the benefit of the stock water system in a drought situation.

The above benefits were incorporated on a gradual basis so they would build up over time. In the base analysis, the benefits accrued at these rates:

- In year one, 50% of the overall reported benefit was gained
- In year two, 70%
- In year three, 90%
- In year four and thereafter, 100%.

The benefits as noted above were all valued using five-year average of the Beef + Lamb New Zealand Economic Service data for North or South Island hill country as relevant. The purpose in using these standardised figures was to eliminate any distortions from differing schedules and years, ensuring that the benefits calculated were just due to changes in stock numbers and/or performance.

**Economic results**

The results of the analysis are given in **Tables 1 to 4**.

**Table 1: Internal rate of return (IRR)**

Range	14-85%
Raw average	45%
Weighted average*	53%
Median	40%

\*Weighted on effective area of the farm

**Table 2: Payback period (years)**

Range	1.5-7.5
Average	3.0

**Table 3: Capital costs/ha and per stock unit**

	TOTAL*	TOTAL	WATER ONLY	WATER ONLY
	Capital cost/ha	Capital cost/SU	Capital cost/ha	Capital cost/SU
Range	\$132-\$811	\$13-\$79	\$98-\$280	\$9-\$28
Raw average	\$362	\$37	\$166	\$18
Weighted average	\$311	\$29	\$154	\$15
Median	\$303	\$32	\$132	\$16

\*Total costs = water scheme + fencing + stock



Dogs in trough – a secondary benefit of trough water

**Table 4: Operating costs/ha and per total stock unit**

	OPERATING COST/HA	OPERATING COST/SU
Range	\$3.13–\$12.56	\$0.17–\$1.22
Raw average	\$6.24	\$0.67
Weighted average	\$4.77	\$0.59
Median	\$5.47	\$0.63

Some of the physical changes pre- and post the water scheme are given in **Table 5**.

**Table 5: Physical changes – average of case study farms**

	PRE-SCHEME	POST-SCHEME
Number of paddocks	70	104*
Stocking rate (SU/ha)	8.5	9.0
Proportion of cattle	39%	40%
Lambing percent	124%	136%

*\*This figure is slightly distortionary in that two of the farms developed techno-beef systems post the water scheme development. If these two farms are taken out of the equation pre-scheme sub-division = 71, post = 87*

Prime stock finishing weights had also increased, with post-scheme lamb carcass weights increasing by an average of 1.1 kg and cattle weights by 20-30 kg. Many farms also saw a marked increase in the number of animals sold prime rather than store.

### Farmer commentary

The case study farmers were also interviewed as to their experience and expectations around installing a reticulated water scheme. Generally, they had all seen the benefits on-farm as outlined above and were confident in their investment decision on this alone. Few had done any formal analysis prior to installation and were pleasantly surprised by the positive results shown in the financial analysis. All the farmers reported that a key benefit of the system was a much greater 'peace of mind' and less stress on staff and stock, particularly in drought situations.

Farmers also reported significant improvement in animal welfare. Nearly all stated they no longer need to drag animals out of muddy dams, stock are less stressed as they do not have to walk long distances to get water, animals can access water quickly and easily, and are fed better due to improved grazing management. They also noted a general improvement in animal health since putting the system in place, and that with the provision of reliable water and good sub-division other options were opening up around cropping and pasture renewal.

When pressed as to the single piece of advice they would offer to farmers, the unequivocal answer by all of them was, 'Just do it!'

**Farmers also reported significant improvement in animal welfare. Nearly all stated they no longer need to drag animals out of muddy dams, stock are less stressed as they do not have to walk long distances to get water, animals can access water quickly and easily, and are fed better due to improved grazing management.**

#### WHAT FARMERS TOLD US

Advice from farmers who have already installed stock water reticulation:

- Get good advice – talk to other farmers who have installed a system, and the pipe companies who have a lot of experience.
- Ensure the water source is clean and reliable – plentiful all year around, including in drought conditions.
- Ensure you understand the requirements for different pressure ratings on pipes, whether pressure-break tanks are needed, what fittings are required to handle the pressure, and what amount of water is needed, especially during peak demand. They noted that it was better to over-spec rather than under-spec.
- Put in more troughs than you think you will need.
- Use trough location to improve grazing management by locating troughs in areas that are currently poorly grazed.
- Fence off gullies and waterways during installation, rather than afterwards (while the fencer is on the property).

Environmental gains were also reported by most of the farmers. Most had an environmental plan and reported that the stock water reticulation and sub-division made implementing it easier. Environmental benefits reported include fencing of waterways to protect the water source and enhance water quality, providing culverts or bridges for all stock crossings on waterways, fencing off dams and wetlands as well as bush, considering QEII covenants of bush, riparian planting and riparian regeneration, planting and fencing old dams, and regular pole planting for erosion control. Many of the farmers noted that even with access to streams, stock preferred drink from troughs rather than natural waterways.

#### Discussion

Overall, the analysis has shown a significant return on investing in a stock water reticulation system, both in monetary terms and farmer well-being. All of the farms showed a return greater than 8% (range 14-85%), which was the targeted rate of return.

For all the case study farms, the advent of the stock water system was the precursor to increased sub-division and resultant better grazing management leading to better animal performance. As such, the overall benefits of the increased stock numbers/performance have been attributed to the water reticulation scheme, albeit also including the capital cost of sub-division fencing and extra stock. Within this, it must be noted that the benefits of good sub-division have long been understood.

All the farmers reported co-benefits from installing their system for the environment, including stock exclusion from waterways, and the protection of native bush as well as wetlands and dams. They reported that they now have 'confidence' to protect these areas without the concern that stock will not have access to water.

Overall, the study demonstrates a clear benefit to hill country farmers of investing in stock water reticulation. The financial benefits are very positive, added to which the non-monetary benefits such as reduced stress, improved animal health and welfare, confidence to protect waterways, improved grazing management and peace of mind during a drought indicate that this investment is unlikely to be detrimental to the health of the farming business. With adequate planning, high quality advice and good quality contractors supporting installation, these systems will provide a positive return on most New Zealand hill country sheep and beef farms.

#### Further reading

Full copies of the study report can be obtained from: [www.agfirst.co.nz/project/economic-evaluation-stock-water-reticulation-hill-country-2017/](http://www.agfirst.co.nz/project/economic-evaluation-stock-water-reticulation-hill-country-2017/), or [www.mpi.govt.nz/growing-and-producing/stock-water/](http://www.mpi.govt.nz/growing-and-producing/stock-water/).

#### Acknowledgements

Appreciation is due to the Ministry for Primary Industries, Beef + Lamb New Zealand, the Ministry of Business, Innovation and Employment and Te Puni Kokiri for funding the project. The case study farmers are also thanked for freely giving their time, information and input into this research.

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# MILK PRICE RISK MANAGEMENT TOOLS AND PRACTICES



This article focuses on the development of milk price risk management practices in New Zealand and other main producing regions covering the need for risk management tools and existing practices, including NZX's NZ Milk Price Futures and Options contracts. It also reveals key trends in the current use and future expectations of risk management tools in New Zealand.

## Increased price volatility

Over the last 10 years, global dairy markets have been exposed to increasing price volatility as demand for dairy proteins in emerging markets grows. The global supply of milk is influenced by uncontrollable factors such as weather, disease outbreaks, and increasing operational and compliance costs. A reduction in government price protection programmes in the US and the EU, coupled with the proliferation of free trade agreements, has also reduced price stability across global dairy markets.

In today's current global trade environment the imbalance in global supply and demand directly influences a farmer's final milk price, with many left to navigate large price swings, never being certain of where their farmgate (milk) price might end up from the beginning to the end of each season. As a result, dairy farmers and purchasers of processed dairy products are seeking risk management tools to improve profit stability or lessen swings in seasonal profit or loss.

In general, farmers using milk price risk management tools are seeking to secure their profit margins and prevent them being negatively affected by adverse price moves for the current season and seasons ahead.

Certainty is a key factor. Being able to reliably budget and forecast your profitability allows for better decision-making when considering whether to invest in further assets, borrow more money, or even purchase a boat or holiday home.

Hedging milk price risk also gives the farmer the opportunity to be counter-cyclical. When milk prices are at elevated levels, so are asset prices such as land, plant and machinery. When milk prices are low, generally asset prices are too, allowing the hedged farmer to take advantage of the surplus cash from hedging activities available during the downturn to purchase assets more cheaply.

Most of all, hedging is about reducing risk. It is about reducing your business's susceptibility to influences that are outside of your control.

## Summary of risk management tools

There are three main risk management tools available across some of the major dairy producing regions:

- Futures and options – derivative contracts listed on global exchanges
- Fixed price supply agreements direct from a processor
- Milk price swaps from banks or other financial institutions.

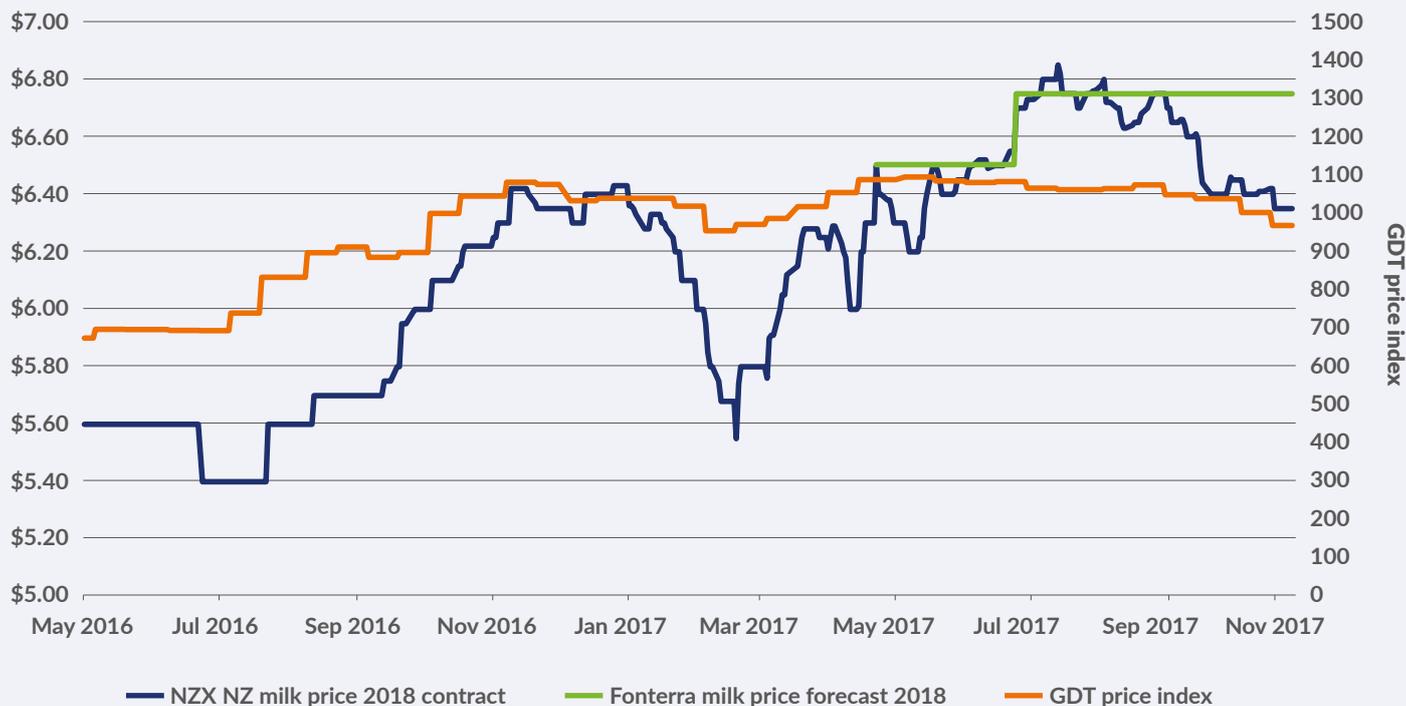


Figure 1: NZX 2018 NZ milk price future contract prices since launch

### Futures and options

Futures are exchange traded forward contracts which establish a fixed price for the underlying commodity for a date in the future. Exchange traded futures and options contracts in agricultural commodities began in 1865 when the Chicago Board of Trade launched its first futures contract on the grain market as a method to better protect buyers and sellers of forward contracts (between two direct counter-parties) against the risk of the other party defaulting or walking away from their obligation. By creating a central platform on an exchange and collecting a cash margin, the risk of a counter-party defaulting on their fixed price obligation was vastly decreased.

### Fixed price supply agreements

A fixed price processor agreement is a contract offered by dairy processors to their farmers allowing them to lock in their milk price for a specified season. The terms of the agreements can vary among processors and regions, including the durations available.

### Milk price swaps

Milk price swaps are a simplified risk management tool for farmers where a fixed price contract is offered to a farmer by a bank or financial institution. Often the bank then trades futures and options via the exchange to pass on the risk acquired from the fixed price contract offered to the farmer. These contracts are mostly used by those who do not want to post a cash margin. Instead, they have the bank or institution take security against their assets to cover the position.

## Dairy farmers and purchasers of processed dairy products are seeking risk management tools to improve profit stability or lessen swings in seasonal profit or loss.

### Overseas use of risk management tools

In the US all three risk management tools are utilised by dairy farmers, with a reported 40% of production being hedged using these tools in some form. Similarly, in Europe farmers have access to futures and options contracts, as well as a range of different processor fixed price agreements, including two and three-year fixed price and even price floors.

New Zealand farmers arguably face the most milk price risk amongst the major dairy exporting nations. With 95% of New Zealand dairy production exported, there is no significant domestic demand base to mute the effects of falling international prices compared to other regions such as the US and Europe, which export less than 15% of their production. In addition to this, the New Zealand Government does not provide direct support or subsidy programmes for farmers, unlike in the US where they have a margin protection programme, and the EU, which has an intervention (price floor) scheme designed to protect prices from falling too far.

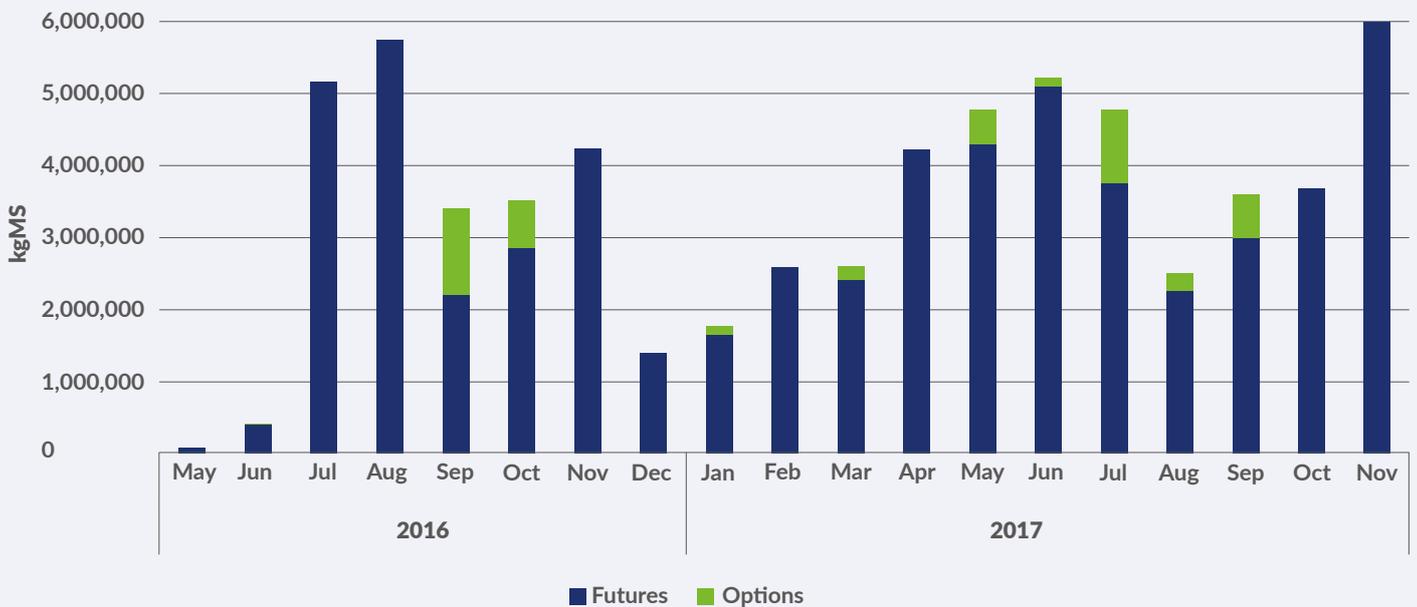


Figure 2: NZ Milk price futures and options traded volumes

## Natural users of futures and option contracts can be identified as farmers who sell milk and want protection from low prices and processors who purchase milk and are exposed to high prices on their cost of goods sold.

### New Zealand risk management tools

Given New Zealand farmers are so exposed to a fluctuating milk price, what tools are currently available to enable them to manage this risk? In New Zealand, Fonterra suppliers had access to the guaranteed milk price (GMP), a limited availability fixed price offering, up until 2015 when it was withdrawn. Currently only one processor is known to offer a fixed price solution, but this has a limited availability and is restricted to its suppliers only.

In June 2016, industry demand for milk price risk management tools was growing following a period of unprecedented volatility, and during this time milk price futures and options contracts became available via the NZX, providing New Zealand dairy farmers and processors with an exchange traded risk management tool to manage milk price risk. The milk price futures and options market provides a solution for farmers supplying most New Zealand processors, and has no limit on quantity so as much production as needed can be hedged through the market.

With no government support programmes or subsidies for farmers, and an absence of processor agreements and milk price bank swaps, farmers rely on futures and options contracts for risk management. It is therefore important that they invest the time to understand the principles of price risk management and how these contracts work, as their international competitors have.

### How milk price futures work

NZ Milk Price Futures contracts are tradeable forward contracts, which allow farmers to lock in some or all of

their milk price for the current season or seasons ahead. They provide farmers with the opportunity to manage milk price risk, and create price certainty, transparency and a forward view of market sentiment.

To be easily exchangeable, the terms of the contract are standardised (exactly the same), except for the price. This allows buyers and sellers to trade freely with each other without the burden of unique or tailored terms. Each NZX NZ Milk Price Futures contract is equivalent to 6,000 kg/MS. These are annual contracts, which align with the New Zealand dairy season. Three seasons are listed for trading – the current season plus two seasons ahead. There are two main characteristics of futures contracts, which include settlement and cash margin.

Today, almost all futures contracts are settled by cash rather than delivering the physical product (e.g. milk solids) when a contract settles. NZ Milk Price Futures contracts are settled in cash against Fonterra's final farmgate milk price, which is released each September. The parties settle the futures contract by receiving/paying the gain/loss related to the contract in cash after it expires.

For example, assuming that a farmer sells some futures to hedge a portion of their production at \$6.00, and at the end of the season the final Fonterra farmgate milk price is announced at \$5.00. The farmer has received \$5.00 in payments from Fonterra and also receives \$1.00 from the settlement of the futures contracts at settlement date, netting out to the futures rate of \$6.00 on the hedged portion of production. Vice versa occurs if there is an increase in the final milk price that goes beyond the futures price.

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## New Zealand farmers arguably face the most milk price risk amongst the major dairy exporting nations.

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Cash margin is another key component of futures contracts, which ensures both parties maintain their obligations and minimise counter-party risk. When entering a futures contract an initial margin is sought, which acts as a good faith bond that will be used if the holder of the futures position fails to meet any obligations. If all obligations are met at settlement then the initial margin is returned in full once the futures position is settled. The initial margin for futures can generally be 5-10% of the face value of the traded contract.

In addition to the initial margin, as prices move throughout the season, variation margin is also collected or paid. Variation margin is a daily valuation, or mark to market, of the futures position based on the daily settlement price on the day. For NZ Milk Price Futures, the daily settlement price is calculated by NZX and is a reflection of where the market settled on the day. The farmer's futures contract rate is then calculated against this and the difference is either received or paid, depending on whether the price has moved for or against the holder of the futures contract.

For example, let us assume a farmer hedges 60,000 kg/MS (sells 10 NZ Milk Price Futures contracts) at \$6.20, and the current season futures have an initial margin (bond) requirement of \$3,000 per contract. On the day the trade is executed the farmer must post \$30,000 initial margin (\$3,000 x 10 contracts). If we also assume that on day two the market price drops and the daily settlement price falls by 0.20 cents to \$6.00, the farmer would receive \$12,000 in variation margin into their brokerage account. Alternatively, if on day two the daily settlement price rises by 0.20 cents to \$6.40, the farmer would be required to pay an additional \$12,000 in variation margin to their brokerage account.

In this way, variation margin is a daily mark to market of the position and seeks to ensure that every trader meets their obligations by posting cash as collateral to back the trade. The farmer's margin is calculated daily and any margin calls must be met within 24 hours. The variation margin balance will change as the price moves, but is not finalised until the futures contract has either gone to settlement or is 'closed out' by buying against the original position.

NZ Milk Price Options contracts are also available as another tool to hedge the milk price, which uses the NZ Milk Price Futures contracts as the underlying asset to derive its value.

### Current trends and future expectations

In the first calendar year since the launch of NZ Milk Price Futures and Options in June 2016, 2.5% of the total milk supply in New Zealand was traded, largely by farmers and processors. Looking to the US example (where it is estimated over 40% of total milk produced is hedged in

some form), New Zealand farmers' involvement and the use of futures and options to hedge their milk price risk is expected to continue to grow as the contract develops, and as more farmers understand risk management and how to use tools such as futures and options.

Natural users of futures and option contracts can be identified as farmers who sell milk and are exposed to low prices and processors who purchase milk products and want protection from high prices. Both parties need to manage risk to protect their profit margin by locking in a price, farmers above their cost of production and processors below the sales price of their finished goods. New Zealand processors often use the NZ Milk Price Futures and Options to offset the risk acquired when offering their international customers long-term fixed price contracts.

To date, from the farmers' side, uptake of the NZ Milk Price Futures has largely been from larger corporate farmers and family farms that are familiar with the concept of risk management and understand how tools such as futures and options work. Generally, these farmers follow risk management policies that require them to hedge mechanically according to price or time-driven signals throughout the season.

Going forward, medium to small-sized farming operations are expected to have a higher understanding of risk management practices as exchanges, brokers, advisors and banks continue to educate the market, and (given the US and European experience) expect to see increasing involvement from medium and smaller-sized farms in the futures and options markets.

To date, accredited brokers have ensured all New Zealand farmers in the market understand the NZ Milk Price contracts and have a risk management policy to suit their needs in place. It is recommended farmers initially contact an accredited broker when considering trading these contracts to establish a risk management policy. The next step if choosing to use the NZ Milk Price Futures involves contacting the bank to set up a margin finance facility to support margin requirements throughout the life of the contract. Then once an account is set up with an accredited broker you can start trading.

### Educational tools

Currently there is a distinct shortage of risk management advice for farmers, not only on the tools available but to educate on risk management as a concept. As price volatility increases, demand for these tools continues to grow, so we expect there to be increased demand for sound independent advice on risk management. To learn more about futures and options contracts, contact NZX Derivatives at: [dairyderivatives@nzx.com](mailto:dairyderivatives@nzx.com).

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BOB THOMSON

# BEEF PRICES AND BOBBY CALVES

## - MAJOR INDUSTRY CHALLENGES FROM A FARM CONSULTANT'S PERSPECTIVE



There has been much talk about how unacceptable it is that over two million bobby calves fail to reach a week of age. This article looks at what could be done with the surplus calves in the context of current and expected dairy and beef prices.

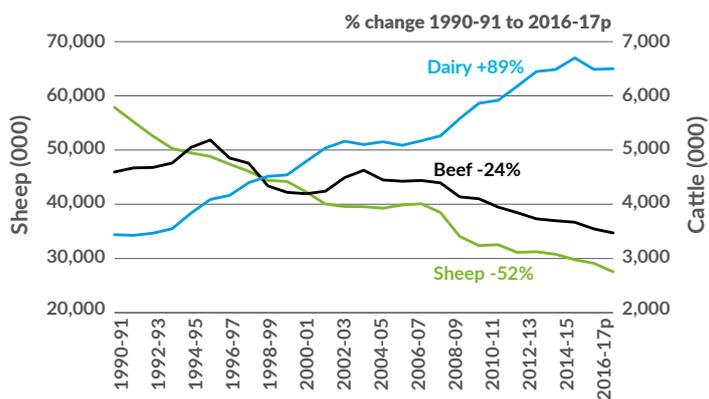
### Surplus bobby calves

Research projects, Kelloggs' reports and industry commentators alike have combined in a chorus, exhorting us to 'rear more and better bobby calves'. This was fair enough to start with, but since 1990 there has been a huge surge in surplus bobby calves coming off the back of a 2.6 million head increase in dairy cattle. The resultant bobby calves have created an increasing threat to our reputation in the market because of animal welfare perceptions, but advice on how and where the surplus will be raised has been less forthcoming.

There have been suggestions that we could rear them as veal, but housing calves in sheds and feeding them like meat chickens or pigs does not sit well with our New Zealand farming ethos. There is a stronger

argument for raising them on pasture because that is natural, the animals will be happy, and it will be environmentally acceptable. However, there is a major challenge with raising these bobby calves on our prime beef finishing land.

As the Beef + Lamb NZ Economic Service have recently reported, since 1990 dairy farming has taken up almost one million hectares of our prime finishing land. This happened with many of us contributing to the change over rather than resisting or pushing back. Perhaps, reluctantly, we accepted that dairy farming was justified because it was the most competitive pastoral land-use option. On the flip side the price for beef and lamb had been too low and many sheep and beef farmers had been encouraged to move over to dairying.



**Figure 1: Sheep and cattle numbers 1990-91 to 2016-17**  
 Source: Beef + Lamb New Zealand Economic Service | Statistics New Zealand

**Farms by farm type 2012**

	NUMBER OF FARMS <sup>1</sup>	AGRICULTURAL AREA (000 HA)
Sheep and beef farming	25,113	9,328
Dairying	12,150	2,415
Cropping	3,297	284
Deer farming	1,128	287
Pig farming	225	11
Poultry	135	3
Total	42,048	12,327
Other (including forestry)	16,020	2,067
<b>TOTAL ALL FARM TYPES</b>	<b>58,068</b>	<b>14,394</b>

<sup>1</sup> Includes non-commercial smallholding farms  
 Source: Statistics New Zealand, 2012 Agricultural Census

**Export Cattle Slaughter – Dairy herd Influence**

Of the 2.45 million slaughter for 2016-17f

Cull cows	37%
Cull dairy heifers	3%
Cull dairy breeding bulls	1%
<b>Dairy Farm total*</b>	<b>41%</b>
Dairy-beef steers, heifers and bulls*	28%
Beef cows, steers, heifers, breeding bulls	31%
<b>Sheep and Beef Farm total</b>	<b>59%</b>
<b>Total Cattle slaughter</b>	<b>100%</b>

\* Dairy genetic origin 41% + 28% = 69%

**Figure 3: Export cattle slaughter in 2016-17**  
 Source: Beef + Lamb New Zealand Economic Service | Statistics New Zealand

**LIVESTOCK OVERVIEW**  
 Livestock numbers at 30 June (million)

	2006	2016	% CHANGE
Sheep	40.10	27.58	-31%
Beef cattle	4.44	3.47	-22%
Dairy cattle	5.17	6.50	+26%
Deer	1.59	0.85	-47%
<b>Total stock units<sup>1,2</sup></b>	<b>93.66</b>	<b>84.31</b>	<b>-10%</b>

<sup>1</sup> Includes goats. <sup>2</sup> Provisional data for 2016  
 Source: Beef + Lamb New Zealand Economic Service | Statistics New Zealand

**Figure 2: Types of New Zealand farms 2012**  
 Source: Beef + Lamb New Zealand Economic Service | Statistics New Zealand

Figure 1 shows there was less than half the breeding ewes and almost a quarter less beef cattle in 2016-17 compared to 1990-91. The sheep and beef numbers contrast with the huge 89% increase in dairy cattle. Beef breeding cows and heifers in calf are down 28% in number since 2000-01, while dairy cows and heifers in calf or milk are up 42%, which has resulted in major land-use change. In particular, sheep and beef lost almost one million hectares of prime land to dairy since 1990-91, mostly in the 2000s.

Figure 2 shows farms by land use and the land area occupied by land use.

Figure 3 shows that the sheep and beef sector is very dependent on the dairy herd for its beef production. On sheep and beef farms the type of cattle processed is close to being equal in number, i.e. 28% of dairy-beef origin and 31% of traditional beef origin. Also, 69% of cattle slaughtered in New Zealand are of dairy origin.

A large part of our beef finishing land has already gone, and in my view we need to get some of it back if we are

**Since 1990 dairy farming has taken up almost one million hectares of our prime finishing land. This happened with many of us contributing to the change over rather than resisting or pushing back.**

to find homes for our surplus bobby calves. Here in the Waikato we estimate that if we are to compete with an average dairy farm, returning \$6.00/kg of milk solids (MS), we would need \$7.00/kg carcass weight for prime beef. We would also need to couple up that high beef price with an efficient beef finishing system to be competitive based on a profit before tax basis (see Table 1). In practice, an efficient beef finishing system would mean wintering the cattle once, not twice, and accepting a lower carcass weight than we have traditionally targeted.

**Table 1: Summary of Waikato dairy vs dairy-beef finishing**

ENTERPRISE	GROSS INCOME/HA	OPERATING EXPENSES/HA	PROFIT BEFORE TAX/HA	\$/KGMS /CW	OTHER \$/KG	COMMENT
Waikato dairy \$6.40	\$7,040	\$5,203	\$1,837	\$6.00	\$0.40	\$6.00/kgMS and \$0.40/kg other
Waikato dairy \$7.00	\$7,700	\$5,203	\$2,497	\$6.60	\$0.40	\$6.60/kgMS and \$0.40/kg other
Waikato dairy-beef current* \$4.95/kgCW	\$1,756	\$1,237	\$519	\$4.95	\$0.00	Purchase calves at \$5/kgLW
Waikato dairy-beef contract \$5.00/kgCW	\$1,600	\$1,231	\$369	\$5.00	\$0.00	Purchase calves at \$5/kgLW
Waikato dairy-beef contract \$5.50/kgCW	\$1,941	\$1,231	\$710	\$5.50	\$0.00	Purchase calves at \$5/kgLW
Waikato dairy-beef contract = \$7.00/kgCW	\$2,965	\$1,231	\$1,734	\$7.00	\$0.00	Purchase calves at \$5/kgLW
Waikato dairy-beef contract = \$8.00/kgCW	\$3,647	\$1,231	\$2,416	\$7.00	\$0.00	Purchase calves at \$5/kgLW
Waikato dairy-beef contract = \$7.00/kgCW	\$3,327	\$1,231	\$2,096	\$7.00	\$0.00	Purchase calves at \$4/kgLW
Waikato dairy-beef contract = \$7.00/kgCW	\$2,603	\$1,231	\$1,372	\$7.00	\$0.00	Purchase calves at \$6/kgLW
ENTERPRISE	AREA	PASTURE TDM/ANNUM	PRODUCTION /HA	\$/TDM	COMMENT	
Waikato dairy (\$6.40)	124	13.5	1,100	\$136	Purchase calves at \$5/kgLW	
Waikato dairy (\$7.00)	124	13.5	1,100	\$185	Purchase calves at \$5/kgLW	
Waikato dairy-beef seasonal current \$	236	12.0	585	\$43	Purchase calves at \$5/kgLW	
Waikato dairy-beef contract (\$5/kg)	236	12.0	516	\$31	Purchase calves at \$5/kgLW	
Waikato dairy-beef contract (\$5.50/kg)	236	12.0	516	\$59	Purchase calves at \$5/kgLW	
Waikato dairy-beef contract (\$7.00/kg)	236	12.0	516	\$145	Purchase calves at \$5/kgLW	
Waikato dairy-beef contract (\$8.00/kg)	236	12.0	516	\$114	Purchase calves at \$6/kgLW	
Waikato dairy-beef contract (\$7.00/kg)	236	12.0	516	\$175	Purchase calves at \$4/kgLW	
Waikato dairy-beef contract (\$8.00/kg)	236	12.0	516	\$201	Purchase calves at \$5/kgLW	

The added challenge is in being able to keep the beef price moving up as dairy companies strive to increase returns through value-added products and better marketing. Back in July when we calculated a beef price to match dairy we agreed that the long-term MS price would be \$6.00/kg plus \$0.40/kg for 'other' farm income. As time has gone on we have come to accept that the MS price will likely be a moving feast and that will place more pressure on improving the beef price.

**Table 1** also shows a range of variables for both dairy and dairy-beef production which detail the returns as mentioned above. The numbers are based on DairyNZ and Beef + Lamb New Zealand Economic Service data relevant to the Waikato. For interest the dairy price has been increased to \$7.00/kgMS inclusive of other income and this would require beef prices to increase to near \$8.00/

kgCW to be land-use competitive. On the other hand, if calf purchase was to reduce to \$4.00/kgLW from \$5.00/kgLW then beef would still not be competitive with dairy at \$7.00/kgCW when dairy is at \$6.40/kgMS.

However, \$7.00/kg for beef has not yet been achieved and we find ourselves in a pincer-like grip. While dairy farming has been pushing us up into the hills and away from our prime finishing land, forestry has been pushing us back down from our steeper land. That downward pressure is increasing with Emissions Trading Scheme (ETS) demands as the government encourages more forestry. We need to therefore take the lead and look for alternatives.

Up until now, as farm consultants we have reached for our latest pastoral farming enterprise analysis and provided the best advice we can, often suggesting farming bulls as

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**Put simply, sheep and beef farming is not land-use competitive and the main challenge is not with low production but with low price. That point is proven as the very best of our dry-stock farming land cannot match returns from dairy farming.**

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they are the most profitable dry-stock option. However, bulls cannot compete with dairying. Put simply, sheep and beef farming is not land-use competitive and the main challenge is not with low production but with low price. That point is proven as the very best of our dry-stock farming land cannot match returns from dairy farming.

I believe that we must stop telling our farmers that they just need to increase production when what they really need is a major increase in price. Farmers are very quick to respond to price incentives. Those of us who can remember back to the 1990s saw the conundrum when we were challenged to lift lamb weights from 13-14 kg up to 17-18 kg or more. Scientists such as Alan Kirton at Ruakura proclaimed it would be problematic and would take many years to achieve. In reality, farmers were buoyed with good price incentives and surprised us by realising those heavier weights much sooner than was thought possible. Encouraging increases in price per kilogram should therefore be the primary focus.

Also, good money is what will glue contracts and relationships together. The money may not be able to be delivered immediately, but at the very least there needs to be a promise from those marketing our products that it is in the pipeline.

#### **The conundrum**

Currently there is not one meat company or associated organisation that can offer a price premium that translates to a significant change in profit per hectare. There is also nothing on the horizon that gives any confidence that price premiums will be any more than 15-20 cents/kg. The possible exceptions are with Firstlight's Wagyu programme and SFF's EQ programme. Unfortunately, while both programmes are commendable they do not translate into a serious increase in profit per hectare so they are not yet good enough. In reality, there are larger shifts with price on the day than with the offerings available through current 'premiums'. Despite all the rhetoric therefore we continue to be hamstrung by price averaging and commodity trading. The challenge is compounded by the fact that we are not land-use competitive on good finishing land and could easily lose more of this land to other more profitable enterprises.

#### **Understanding farmers and supply management**

While our beef and lamb prices continue to founder our extension agencies are encouraging farmers to produce

more. We continue to read surveys and reports showing the large gap between the high and the low performers. Recently the ANZ Chief Economist, Con Williams, drew our attention to the fact that on sheep and beef farms the profit gap is widening.

While there is a serious opportunity for the low performers to lift production and profit, many are older farmers with low indebtedness who are happy to go along 'doing what they've always done and getting what they've always got or a bit less'. When and if these farmers choose to change is another story. Deciding to change up a gear will be facilitated by farm succession or by visiting the farms of higher-performing farmers, and this is a 'pull through' process as opposed to a 'push them' process. Our focus should be with the higher performers who are prepared to change and take their chances with new opportunities.

One of the major strengths of farm consultants is their understanding of whole farm systems. When cattle are contracted to a specific market requiring all-year-round-supply, farmers are challenged to deliver product in full, on time and to specification. Robust farm monitoring and information systems are therefore needed. The proposition is that supply management is the territory of experienced farm management consultants because we understand farm systems and the processes to manage them. Like farmers, farm consultants understand how you need to have mobs that buffer those on contract and how supply must be spread across a range of environments to guard against climatic variability.

There are many examples of meat companies that have lost markets by failing to deliver product to specification, or have shied away from a market opportunity because they know they will not be able to deliver. This is not necessarily a criticism of meat companies, but rather a symptomatic problem associated with a lack of collaboration between the key players.

Contracts have been broken by farmers because the spot price has been well above the contracted price, or they have been overtaken by a weather event, or have been too ambitious with their capacity to deliver. Meat companies have also reneged on contracts. For all these reasons, a low level of trust has pervaded the relationships between meat companies and farmer suppliers.



**Lamb is currently selling north of \$7.00/kg and venison over \$9.00/kg. My view is that beef has the potential to realise more than \$7.00/kg too, at least for those who are prepared to step up their supply capability and engage with marketing companies that are also prepared to do this.**

#### **The solution**

For beef, there are markets where consumers value and pay for products that are healthy and sustainably produced. The premium for these sorts of markets is in the 15-20% range, which if returned to the beef producer would result in a schedule nudging up toward \$7.00/kg carcass weight. Lamb is currently selling north of \$7.00/kg and venison over \$9.00/kg. My view is that beef has the potential to realise more than \$7.00/kg too, at least for those who are prepared to step up their supply capability and engage with marketing companies that are also prepared to do this.

If we are to take advantage of markets that value sustainably produced New Zealand beef there will be an associated increase in the cost of production. A Beef + Lamb New Zealand funded Beef Profit Partnership project in Northland calculated that cost at ~\$0.40/kg carcass weight. That cost included all-year-round supply, regular weighing to monitor progress and full animal traceability.

#### **Quality assurance and farm consultant role**

The cost of high-level quality assurance (QA), demonstrating that the animals have been farmed sustainably, will be a small but additional expense. All this translates to the fact that when you provide a high-quality beef product in full, on time and to specification there is a cost and therefore there must also be a significant reward.

Farm assurance for base-level QA is necessary and is a cost of doing business, but higher-level QA is much different and should be rewarded. Quality is defined as 'fitness for purpose' and our customers need assurance of this. In this case, it relates to a farmer being able to demonstrate they are farming sustainably:

- A Land and Environment Plan will have been completed at Level 3
- An Animal Management Plan will have been completed which embraces an Animal Health Plan based on demonstrated need principles, good animal welfare practices plus plans to ensure stock are well fed, especially in challenging times
- A Social Responsibility Plan will have been completed to demonstrate that people are kept safe, are helped to develop and grow within the business, and that there is awareness and a contribution toward the vibrancy of the wider farming community.

While these standards may seem challenging to some, many farmers are already operating up toward this level, albeit without the necessary and associated documentation. We must encourage and support initiatives where higher standards and levels of on-farm monitoring not only contribute to better farm performance but also result in market rewards, and this is especially the case for higher-level QA.

**If we were to reduce dairy cows by just 700,000 we would have the land area available to raise all the surplus bobby calves as prime beef. A huge bonus would be a smaller environmental footprint and the removal of a potential market threat.**

A key role for farm consultants is with supply management, which requires skills in the application of Farmax and the FarmIQ Farm Management System. There will also be a need for a thorough understanding of farm systems on a whole farm basis. By providing these skills and this type of service a farm consultant is an important and vital member of a team focused on new and innovative market opportunities.

#### A new and better direction

In the Waikato, we are now working on a new programme backed up with best practice environmental and animal welfare standards. Just claiming to be 'clean and green' is not good enough because that is what everyone says, even when our bull beef is commodity traded and destined for hamburgers.

In collaboration with local meat companies, and with support from the Red Meat Profit Partnership (RMPP), we are helping to build a high-level QA programme supported with robust supply management to underpin this new market initiative. We will be targeting dairy beef and the expectation is that we can be part of a programme that will be land-use competitive. Cattle will be contracted from 'birth to box' and the resultant beef product will be contracted and connected through to the consumer.

With a schedule payment of \$7.00/kg, dairy farmers on marginal land will likely consider returning to beef finishing. With a change in land use they will reduce their environmental footprint because there will be less dairy cows, which will also mean less bobby calves. If we were to reduce dairy cows by just 700,000 we would have the land area available to raise all the surplus bobby calves as prime beef. A huge bonus would be a smaller environmental footprint and the removal of a potential market threat.

The challenge to our dairy farmers is to produce the same amount of MS from around 14% less dairy cows. Our sheep farmers have provided us with an industry case study which shows that since 1990 they now produce the same amount of lambs with half the number of ewes. They did this by farming smarter, so can dairy farmers do the same?

Figure 4 illustrates the huge and consistent reduction in ewe numbers and the maintenance of export lamb production between 1987-88 and 2017-18.

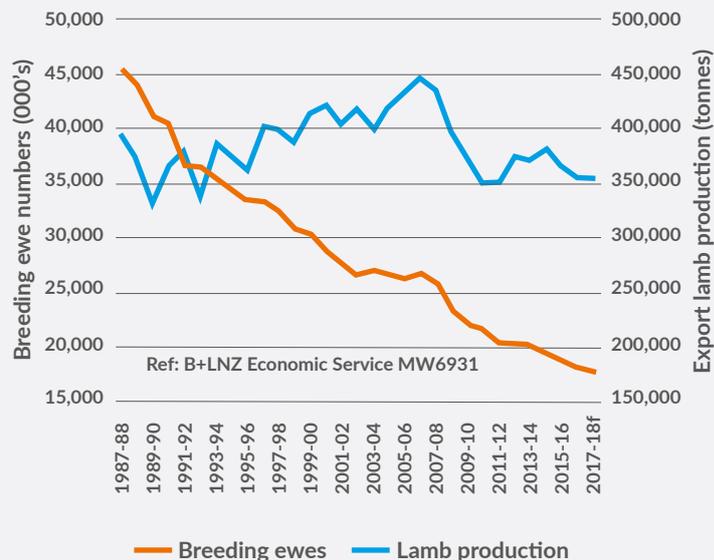


Figure 4: Breeding ewe numbers and export lamb production

I am confident that by working together with forward-thinking meat companies we could achieve a \$7.00/kg schedule for prime beef, be more land-use competitive, and start to resolve the issue with bobby calves. If this solution works in the Waikato, farm consultants in other regions may be challenged to do the same.

#### Conclusion

Although the bobby calf challenge belongs to the dairy industry, ironically the solution is with the beef industry. That solution will only be possible if beef prices are lifted to a level where beef farming is land-use competitive with dairy farming. When that happens there will be beef-finishing land available for raising the surplus calves. Unless this occurs, bobby calves will remain a major market threat to both our dairy and beef industries. This leaves two questions:

- Does the beef industry recognise its vulnerability and its responsibility?
- Will we continue to do what we have always done or will we choose to be part of the solution?

#### Reflection

Having been involved in the sheep and beef industry for over 40 years, I believe that while we can celebrate substantial increases in land value over that time the cashflow return on investment has been very poor. Ironically, while the dairy industry has made a significant contribution to the increase in sheep and beef land prices, in the process almost one million hectares of our prime finishing land has gone. Consequently, our environmental and animal welfare challenges have been exacerbated. Bobby calves are a 'burning raft' and we need to put out the fire before we all sink.

RD (Bob) Thomson is a sheep and beef farm consultant at AgFirst Waikato. Email: bob.thomson@agfirst.co.nz.



# THE NEW ZEALAND HORTICULTURAL SECTOR – GROWING WITHIN LAND CONSTRAINTS

**Horticulture is growing fast and is tipped to be the leading primary industry within a generation, as consumer tastes change and global interest in the environment accelerates. The New Zealand horticulture industry is in good heart to meet future demand, provided access to land, water and labour needs can be met.**

#### High-value industry

New Zealand horticulture is a high-value industry contributing to the economy and growing fast. With an industry value of \$5.6 billion (excluding wine), we export 60% of what we grow, i.e. \$3.4 billion in value to 124 countries. Fresh fruit exports in 2016 increased by an impressive 35% over 2015. Outstanding performances were seen by:

- Kiwifruit at \$1.7 billion, up nearly \$500 million or 42% on 2015 – kiwifruit exports are now worth more than New Zealand's wine exports (\$1.55 billion)
- Apples at close to \$700 million, up \$130 million or 23% on 2015
- Blueberries rose 50% on 2015 to \$36.5 million
- Cherries rose by 30% to \$68 million.

Onions dominated the fresh vegetable export sector with a sizable increase of 38% from \$81 million to \$112

million. Overall, the vegetable export sector rose 4%. In this sector, 60% of the value is a mixture of fresh, frozen, dried or a vegetable preparation (this area is dominated by peas, potatoes and sweet corn). Much of our vegetable sector supplies New Zealand's domestic market with both fresh and processed product and is valued at approximately \$2 billion.

#### Free trade agreements (FTAs) and sustainability

FTAs are a large part of why we are growing so rapidly since lower tariffs mean higher profits. Global trends such as Brexit and the US President's views on trade, as well as the unknowns about the new New Zealand government, may impact on future growth. However, the industry is hopeful that progress will continue to be made on trade deals post-Brexit and with a Trans Pacific Partnership (TPP) without the US.

People globally are seeking out healthy food and lifestyles and increasingly they are making food purchasing decisions based on values. These values might include wanting to know where the food comes from and that it is sustainably and ethically produced. This is good for the New Zealand horticulture sector as we have a good story to tell.

Many of our growers are inter-generational family businesses with a lot of collective knowledge about cropping systems and the environment. Caring for the environment is in their DNA and they are invested in delivering their businesses to the next generation in an even better state. No-one is more aware than our growers that environmental sustainability is paramount as it relates to fresh water and horticulture.

#### **Better ways of operating**

New Zealand growers are early adopters of science and technology to match changes in consumer demands. There has been considerable investment in all aspects of production, and some of our packhouses are driving efficiencies and improving quality with cutting-edge technology and innovative working practices.

With the ideal climate and soils, efficient people and systems, and an ideal location with proximity to key markets, horticulture has huge potential.

#### **Protecting our domestic food supply**

However, the story is not all happy. We are concerned about our domestic food supply as across the country a piecemeal approach to solving housing shortages is seeing valuable growing land turned into housing. Once it

**New Zealand horticulture is a high-value industry contributing to the economy and growing fast. With an industry value of \$5.6 billion (excluding wine), we export 60% of what we grow, i.e. \$3.4 billion in value to 124 countries.**

is paved over this is not land we will ever get back. Local government looks at what is right for its own patch of the country, but there needs to be some overarching view on how that might impact on New Zealand's total food supply.

Not all land is suitable for horticulture and some of the areas where it flourishes are unique. For example, Pukekohe has elite soils suited to growing vegetables and its frost-free climate means growing can be year-round. If Pukekohe expands with 50,000 houses, as per the Auckland plan, that puts our ability to feed ourselves at risk.

Protecting high-value land for growing fruit and vegetables is one of our very strong ongoing campaigns. There are some areas in New Zealand (such as Northland, Pukekohe, Bay of Plenty, Hawke's Bay, Horowhenua, Nelson, Canterbury, Central Otago and Southland) that are particularly well suited to horticulture growing. These areas need to be protected through government policy when it comes to planning new housing and urban development, as well as how water is allocated.



Housing development near prime horticultural land



## Protecting high-value land for growing fruit and vegetables is one of our very strong ongoing campaigns.

To this end, we think New Zealand needs a food security policy set by central government. We need to take a holistic approach to ensuring continuous seasonal supplies from the different growing regions in New Zealand. In November 2017, we released a report *New Zealand Domestic Vegetable Production: The Growing Story* to inform decision-makers and get the conversation started about how to best protect our domestic food supply (available at [www.hortnz.co.nz](http://www.hortnz.co.nz)).

### **New Zealand as a self-sufficient food producer**

Our initial thoughts for the protection of high-quality growing land would result in a two-tiered approach: using national policy statements or national environmental standards under the RMA, in conjunction with a central government policy for food production and security. The point we are making is that New Zealand needs to be able to feed itself with fresh, locally grown produce and not have to rely on imported produce. There are no guarantees, given global competition, that other countries would even have food available for us in the future at a reasonable price.

With reduced supply, and increased demand, there is only one way for prices to go and that is up. We believe

it is essential to the health of our nation to have fresh, healthy food that is accessible and affordable. Trends indicate a strong desire by consumers to buy fruit and vegetables that are locally grown, and to understand what has gone into producing their food. While some will always buy on price, a section of the population seek more information before they purchase.

### **Country of origin labelling (CoOL)**

A Consumer New Zealand survey in early 2017 showed that 71% of New Zealanders want to know where their fruit and vegetables come from and 70% also want to buy New Zealand-grown. Consumers want mandatory CoOL for fresh fruit and vegetables, something New Zealand lags behind other countries on – it is only voluntary here and not law.

Offshore our food commands a premium because it is known to be safe, high-quality and healthy. There is a lot of talk about selling the New Zealand story, yet we don't even label our own fruit and vegetables in our own country. We are hopeful that mandatory CoOL for fresh fruit and vegetables will become law within the next year.



*The brown marmorated stink bug is horticulture's number one threat*

### **Pests and diseases**

There are other issues facing the industry too. In spring and summer, our top biosecurity threats are the brown marmorated stink bug (known as BMSB) and the Queensland fruit fly, as this is when they are most likely to arrive in New Zealand and attempt to take up residence. Biosecurity remains the number one priority for horticulture as we have seen the effects of pests and diseases in wiping out crops, and with that livelihoods.

We are asking everyone in New Zealand to be on the look out for the brown marmorated stink bug and the Queensland fruit fly. If you see either please catch it, take a photo, and report it as soon as possible to the Ministry for Primary Industries on 0800 80 99 66.

**Biosecurity remains the number one priority for horticulture as we have seen the effects of pests and diseases in wiping out crops, and with that livelihoods.**

### **Demand for labour**

As horticulture grows, so too does our demand for skilled and reliable labour. We need to attract talent to horticulture as we have incredible careers on offer. This is no easy task and as an industry we need to partner with the government on this, including getting training tailored to industry needs. We also need the good initiatives that give us access to seasonal labour, such as the 10-year-old Recognised Seasonal Employer (RSE) scheme that brings in workers from the Pacific Islands, to continue.

### **Urban-rural disconnect**

The make up of New Zealand's population is changing, with city dwellers no longer having connections with rural communities that they once might have had. So there is not the understanding of what goes into getting fresh food onto their plates, but there are a lot of demands for convenient packaging and year-round availability at an affordable price. Like many other primary producers, we face the challenge of telling our story to new generations of consumers who have very different expectations.

### **The number one exporter**

Horticulture has been tipped to be New Zealand's number one primary industries' exporter within a generation. Horticulture New Zealand intend to do all we can to support that growth, while continuing to feed New Zealanders the best healthy food.

*Mike Chapman is Chief Executive of Horticulture New Zealand. Email: [mike.chapman@hortnz.co.nz](mailto:mike.chapman@hortnz.co.nz).*



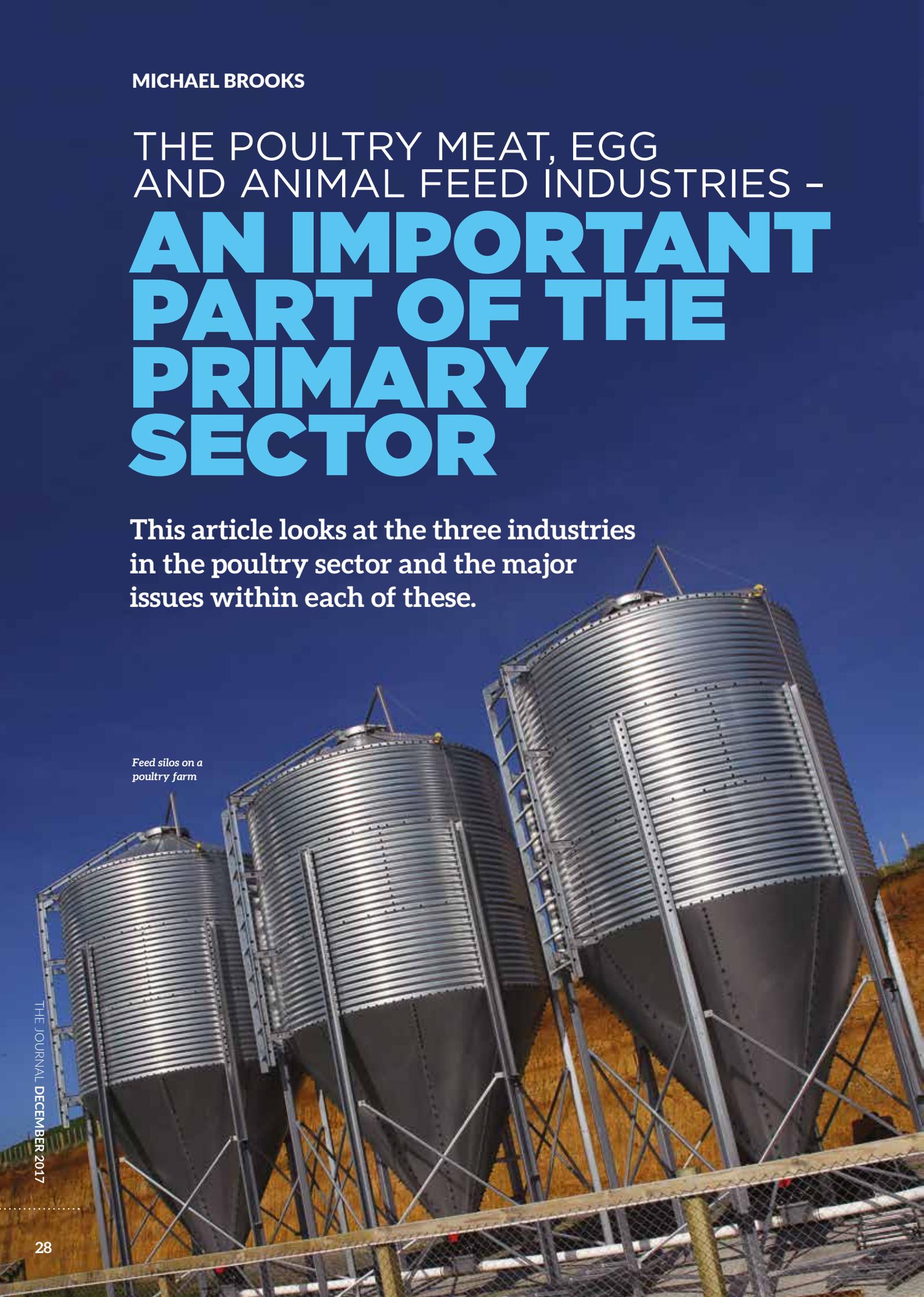
*Baby kiwi canopy*

MICHAEL BROOKS

# THE POULTRY MEAT, EGG AND ANIMAL FEED INDUSTRIES - **AN IMPORTANT PART OF THE PRIMARY SECTOR**

This article looks at the three industries in the poultry sector and the major issues within each of these.

*Feed silos on a poultry farm*



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## Antibiotic use here is also one of the lowest in the world, and no antibiotics of high or critical importance for humans are used routinely in the New Zealand poultry industry and have not been for many years.

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### A significant player

If you want to make a poultry farmer chuckle, try telling them that their activity isn't really farming, not like dairy or beef or sheep. The remark is made more often than you think and poultry farmers know their statistics:

- When it comes to meat consumption, chicken is the most consumed protein in the country (*Farm Facts*, 2017) and is often the first choice for New Zealand consumers (Colmar Brunton)
- New Zealanders each consume about 41 kg of chicken every year (about 23 chickens per person, per year), and adding in other types of poultry such as duck and turkey it is around 43 kg
- To meet this demand, there are 185 poultry farms in New Zealand, and including the workforce at several processing plants the industry employs around 4,000 people.

The figures for eggs are comparable. New Zealand produces over one billion eggs each year and Kiwis are one of the world's highest per capita consumers of table eggs at around 235 eggs per person, per year, or 4.5 eggs per week. Not to mention the many eggs that find their way into our diet as ingredients in processed foods.

When it comes to animal feeds, the humble hen is also a major player. Of the 996,000 metric tonnes of feed consumed by the poultry, pig, calf and dairy sectors in 2016, NZ Feed Manufacturers Association statistics show that poultry meat and layer hens consumed around 65%. Poultry is therefore an important part of the primary sector.

### Poultry meat industry

#### Meat chickens

Some of the mistaken notions about the meat chicken sector, which makes up the largest group of farmed birds in New Zealand, may be due to its small number of players. Just four large companies – Tegel, Inghams, Brinks and Turks – carry out 99% of the country's commercial poultry farming and processing.

The four companies are modern, highly efficient and vertically integrated. They own or control the entire chain of production from breeding farms, the chickens on the farms and the processing plants through to marketing, branding, retailing and exporting. Farmers typically work for companies on a contract management basis and some companies also own and operate their own large feed mills.

Meat chicken farms are clustered around several processing centres because welfare requirements prohibit their transport over long distances. The processing centres are in West Auckland, central Waikato, New Plymouth, Foxton and Christchurch.

Chicken meat exporting is small in world terms, but in a fiercely competitive world market New Zealand is slowly building niches in countries such as Australia and the United Arab Emirates, as well as longstanding markets in the Pacific, including Polynesia and Melanesia.

#### Antibiotics and hormones

The low profile that is typically kept by New Zealand poultry processors, except of course for their branding activities, can sometimes give rise to mistaken notions. Some of the most persistent are that birds are routinely fed antibiotics and growth hormones. However, antibiotics are only used in New Zealand flocks under strict veterinary prescription.

Antibiotic use here is also one of the lowest in the world, and no antibiotics of high or critical importance for humans are used routinely in the New Zealand poultry industry and have not been for many years. This is a policy that many overseas chicken farmers and companies are just adopting.

Similarly, New Zealand meat chickens are not given hormones. The practice is illegal, has been banned for 50 years, and regular testing by the Ministry for Primary Industries (MPI) has never revealed a single instance of hormones being used.

#### Caged, barn and free-range systems

Another myth is that New Zealand meat chickens are raised in cages, but they are in fact raised in either barn or free-range production systems. In barn systems, chickens are housed in large open-plan poultry houses called 'sheds' which can be up to 150 m long and 15 m wide and hold up to 40,000 adult chickens. Sheds are equipped with computer-controlled automated temperature and ventilation controls and feed and watering systems, and have litter (wood shavings) spread over concrete floors so they remain dry underfoot.

Free-range systems offer the same conditions as barn systems, but the hens are provided with access via pop-holes to outdoor ranging areas that also provide shelter and shade. This results in the good conditions that are enjoyed by chickens in both production systems. Combined with the use of breeds like Ross and Cobb, which produce good body conformation and excellent



Inside a meat chicken barn

## The New Zealand egg industry is unique in that it is the only agricultural sector that is annually audited by MPI verifiers.

meat, this means that the plumpness of New Zealand meat chickens is derived entirely from genetic selection, good welfare, world-class farming practices, and an environment free from the world's major poultry diseases.

### **Turkey and duck meat**

While meat chickens are most popular with New Zealand consumers, two other poultry meats are becoming increasingly sought. Turkey is a lean, healthy meat that is growing in demand beyond the seasonal Christmas period and three producers in the South Island raise around 250,000 turkeys every year. The predominant breed is the British United Turkey.

Thanks to increasingly sophisticated Kiwi palates and recent Asian immigration, duck is also gaining in popularity. Ducks are raised in barns for biosecurity reasons to avoid contact with other waterfowl, which are significant carriers of avian diseases. The breed used is the white Pekin duck bred by Grimaud Frères in France.

### **Freedom from major poultry diseases**

Poultry in New Zealand is raised in one of the healthiest environments in the world. A combination of natural geographical advantages (this country is located well away from major avian flyways) and extremely strict biosecurity means we are free of the three major diseases – avian

influenza, Newcastle disease and infectious bursal disease – that affect avian species worldwide.

Good stockmanship practices and high government-mandated welfare standards also make the industry admired by its peers around the world. This unique avian disease-free status has seen the world's two largest breeding companies, Cobb and Ross, invest in major breeding operations here with an eye on supply for the phenomenally large Asian market.

### **Eggs – an industry undergoing change**

In marked contrast with the meat chicken industry, the New Zealand commercial egg industry is made up of 172, mainly small and often family-run, enterprises located from Invercargill to Kaitaia.

The national flock of layer hens is currently estimated at 3.6 million birds and domestic consumption largely takes care of almost all production. However, while still modest, exports of table eggs and egg products are steadily increasing. Four egg production systems are currently used:

- Current cage – 63% of production
- Free-range – 20%
- Barn – 2%
- Colony cage – 15%.

The New Zealand egg industry is unique in that it is the only agricultural sector that is annually audited by MPI verifiers. All commercial egg farms in this country must have a registered food safety plan and are audited by MPI to ensure they meet high standards, which is one of the reasons why salmonella has never been found inside a New Zealand egg. This is a unique status which our Australian counterparts and others around the world do not have.

Despite being located often in peaceful rural settings, the egg industry is undergoing significant change. With the release of the Animal Welfare (Layer Hens) Code of Welfare 2012, the industry was given a scant 10 years to quit the 'current cage' system, known to its detractors as battery cages. Transition timetables were put in place to move current cage producers to three alternative production systems (colony cage, free-range and barn), which are deemed by the government-appointed National Animal Welfare Advisory Committee (NAWAC) to meet the requirements of the Animal Welfare Act 1999.

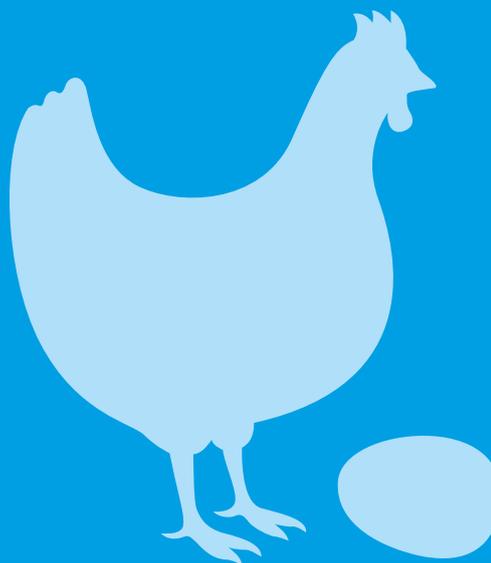
The adjustments this has required of the industry have been huge. Two independent economic analyses in 2012 found that the nation's then 46 current cage farmers would have to bear a transition cost of at least \$150 million. Despite the resultant upheaval as players adapt, merge, consolidate, and enter and exit the industry, it is successfully meeting its transition requirements.

The export of table eggs, as with meat chicken, is also a difficult undertaking. This is especially so because New Zealand has no common land borders, but exports continue to grow to the Pacific Islands, Papua New Guinea, Singapore and Hong Kong.

### **Animal feeds – the sector's quiet engine**

The animal feeds industry is the most 'under the radar' member of the three industries administered by the Poultry Industry Association of New Zealand (PIANZ) office and is in many ways their quiet engine. Known collectively as the New Zealand Feed Manufacturers Association (NZFMA), it comprises 46 feed manufacturers and blenders supplying the primary sector in New Zealand, as well as 62 associate members who are providers to (or otherwise affiliated with) the industry. Feed manufacturers and blenders operate 37 feed mills throughout the country.

As mentioned, the poultry industry is a major animal feed consumer. Although significant amounts of New Zealand-grown wheat, maize, barley and other grains find their way into poultry feeds, around 58% of the industry's requirements are imported, mostly from Australia and primarily for reasons of price.



# THE CHICKEN AND THE EGG

## TWO INDUSTRIES WITH DIFFERENT FARMING STYLES AND SET UP REQUIREMENTS

### POULTRY MEAT

- In the vertically integrated meat chicken industry, the four main processing companies own the birds. Farmers enter the industry by purchasing a new or existing farm which must be within two hours of a processing plant and meet strict standards for shed construction and equipment.
- The companies provide formulated feed and veterinary advice. On-call assistance is available from company livestock managers.
- The scale and advanced technology of a farm typically requires a seven-figure investment.

### LAYER HENS (EGGS)

- Small free-range farms offer initial ease of entry and most of the nation's egg farms are small family-owned operations. Free-range farms must have sufficient land to meet the maximum free-range stocking density of 2,500 birds/ha. Investment is also required in packing facilities and in establishing customers.
- Economic realities mean that commercial-scale farms range in size from 2,000 birds to much larger. Recent decisions by supermarkets are likely to lead to even larger-scale free-range and barn system operations.

### INDUSTRY TRAINING FOR FARMERS

- EPF and PIANZ both actively encourage industry training via poultry-specific Primary ITO qualifications from Levels 2 to 4.

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New Zealand-grown wheat also typically has higher moisture levels and requires consequent drying. Together with high transport and distribution costs from the South Island, where the bulk of grain is produced, this serves to keep the poultry industry's use of New Zealand grain at around 42%.

Like the two poultry industries it supplies, the feed industry is constantly looking to enhance its standards. A recent very successful initiative is FeedSafeNZ, an industry-wide quality assurance programme designed to enhance the manufacturing standards of New Zealand-produced stockfeed and provide increased risk mitigation in the manufacturing and use of animal feeds.

Based on the NZFMA's Code of Good Manufacturing Practice, FeedSafeNZ requires stockfeed manufacturers to meet minimum standards in a comprehensive range of criteria including buildings and grounds, plant design and equipment, lighting and ventilation, waste, storage, record-keeping, production control, ingredients and staff training. Annual site audits are conducted by the independent third-party auditor,ASUREQuality, and to date 25 mills have been FeedSafeNZ-certified with others pending. The success of the scheme is likely to make FeedSafeNZ certification a mandatory requirement for NZFMA manufacturer members in the future.

### The welfare challenge

#### **Strict Code of Welfare**

Like any livestock industry today, poultry faces criticism from activist and other groups who either misunderstand the industry and/or have non-supportive agendas. Despite undertaking world-leading initiatives, such as the complete phasing out of current cages by 31 December 2022 (the EU is the only other market to do this), the New Zealand layer hen industry attracts more than its fair share of headlines.

However, welfare is at the heart of every egg farmer's daily activities and stockmanship. The knowledgeable and skilful handling of hens which provides protection, comfort and respect for their needs is the first standard set out in the Code of Welfare that farmers must comply with.

Stockmanship and welfare are also key elements in the unit standards of the Level 2, 3 and 4 NZQA qualifications that the Egg Producers Federation (EPF) and PIANZ offer in partnership with the Primary ITO. The EPF and PIANZ also offer an annual combined industry award to a poultry industry trainee who encourages the status and importance of training.

Also, both poultry industries work closely with MPI and NAWAC to review and develop new or enhanced welfare standards and practices as updated science-based research becomes available. The view of both industries is that healthy birds provide better returns for producers and better products for consumers. Proof of the effectiveness of the industry's investment in good welfare is the low level of poultry-related animal welfare complaints received by MPI.

In an overview of cases from 2008-2014, the layer hen industry was the second-lowest sector in terms of percentages of complaints at .09%, or six complaints a year (the lowest sector for complaints was the meat chicken industry). Over those years, only one case per year was deemed to require a full investigation and in each instance the matter was resolved by follow-up action by the farmer.

#### **Moves to ban colony-farmed eggs**

In the face of emotional outpourings from social media about alleged practices and conditions in the poultry industry, the objective and rational voices of science and even expert opinion often find it difficult to be heard. Such negative influences have recently led some supermarkets to decide to actively reduce consumer choice about the types of eggs they can buy by deciding to ban colony-farmed eggs by 2027.

The same scenario is also leading to criticism of the colony cage egg production system. In 2012, at the time of the release of the Layer Hens Code of Welfare, this system was unanimously endorsed by NAWAC members as providing equivalent or superior overall welfare compared to free-range and barn.

The EPF believes that the option of banning colonies as proposed by organisations such as SAFE (Save Animals From Exploitation), an animal advocacy organisation, and the RNZSPCA (the Royal NZ Society for the Prevention of Cruelty to Animals) is against good welfare and an attack on the NAWAC consultation process that has seen New Zealand recognised as a world leader in animal welfare. In our view:

- A ban on colonies would directly impact on the price of eggs, removing a healthy food option for lower socioeconomic groups
- It would also remove some of the country's ability to be self-sufficient in a staple product and leave it vulnerable to a biosecurity 'bomb'
- A diverse market with different production systems protects the consumer, meets reasonable welfare expectations, and protects the farmer's risk and export opportunities.



Free-range meat chickens

## A ban on colonies would directly impact on the price of eggs, removing a healthy food option for lower socioeconomic groups.

### Farm to table, health and traceability

A related cluster of public perceptions about the provenance and safety of food is also having an impact on the egg and meat chicken industries. A recent fraud scandal involving the passing off of cage eggs as free-range has seen the industry move to implement egg stamping as a mark of quality assurance and real traceability back to the farm.

New Zealand meat chickens already offer a high degree of product traceability. Every care is taken of the birds from the farm right through to the consumer's table. Birds are traceable back to their point of origin and each part of their journey – from day-old chick to harvest, from truck to processing and then to the supermarket shelf – is governed by the strict Code of Welfare.

PIANZ also works closely with vets, the government, scientists and researchers to ensure that birds remain healthy and disease-free. Pathogens (disease-causing

organisms) like campylobacter and salmonella are found almost everywhere in our daily environment, including on raw chicken meat, and if proper safe food handling practices are not followed serious illness can result. As part of its commitment to reducing foodborne illnesses, PIANZ strongly supports and promotes food safety messages about handling, storing and cooking poultry.

### International recognition

Due to the nature of intensive livestock farming the New Zealand poultry industry is sometimes held up for criticism. However, international avian experts rate us as the greatest country in the world for raising poultry due to our freedom from major diseases, high farming standards, stringent biosecurity and good regulatory oversight. The industry is committed to maintaining and enhancing this status.

*Michael Brooks is Executive Director of PIANZ, the EPF and the NZFMA. Email: [michael@pianz.org.nz](mailto:michael@pianz.org.nz).* 

BRIAN MCDONALD

# NEW ZEALAND GARLIC

## A SUCCESS STORY

Small but powerful, New Zealand garlic is a rising contender in the horticulture sector. Strongly preferred at home, and enjoyed abroad, garlic is well suited to this country's temperate climate.



### Growing regions

Chefs know it as the perfect complement to many dishes, its pungent flavour unmatched and unmistakable. But how many give thought to where the garlic in their kitchen comes from, and what it takes to grow it? The answer may surprise them. Garlic was first cultivated commercially in New Zealand in the late 1950s and early 1960s, and quickly solidified its place in Marlborough and Pukekohe.

Most New Zealand garlic is grown in the Marlborough region from January to November. The combination of a hard winter, wet spring and a long, dry summer suits garlic growing perfectly, resulting in excellent quality. New Zealand garlic is distinctively fresh and juicy, with a very strong pungency and flavour. Marlborough garlic will keep for up to 11 months in a cool, dark, well-ventilated place. As this region cannot supply the whole country, Pukekohe garlic is available in December in time for Christmas.

Traditionally, garlic was planted on the winter solstice (around 22 June in the southern hemisphere) and harvested at the height of summer in mid to late January. Garlic requires a decent winter chill to properly begin growing, a fair amount of rain during spring for the bulbs to grow correctly, and a long, dry summer. All of this combined makes Marlborough ideal for garlic, as it does for the wine grapes the region is well known for.

**New Zealand garlic is very popular, and compares favourably to imported varieties for taste and overall quality. Generally, one bulb of New Zealand garlic will have the same strength of flavour as three imported bulbs.**

### New Zealand versus imported garlic

New Zealand garlic is very popular, and compares favourably to imported varieties for taste and overall quality. Generally, one bulb of New Zealand garlic will have the same strength of flavour as three imported bulbs. Also, as New Zealand garlic is generally grown close to its market it is also not usually cool stored. This is process that can dehydrate the bulbs, which means they will not lose their juiciness.

### Harvesting

According to traditional growing methods, garlic is harvested when the leaves of the garlic plant start to brown. This is no longer accurate, but as mentioned mid to late January is when most of the New Zealand growers start to think about harvest. After good rain to get it going, dry days are preferable to harvest in. The bulbs



**Almost all of New Zealand's exported garlic is sent to the Pacific Islands. Exports in 2016 had a value of \$900,000 compared with \$600,000 in 2015. The value of the domestic market in 2017 was \$7 million.**

are easily damaged too, so hand harvesting is preferred over mechanical. Interesting research is being carried out overseas, attempting to emulate the human hand harvesting, not just for garlic but for kiwifruit, peaches, and other fragile fruit and vegetables.

#### **Pests, diseases and weather**

Garlic bulbs may be fragile, but as long as the conditions are right it is fairly easy to grow them. However, there are some issues that can cause major problems for growers. Fungal diseases are a serious risk for garlic. Infections such as white rot can severely damage a crop's quality, even leading to it being completely destroyed if not caught and treated. Nematodes, tiny worms that live in the soil, can also wreak havoc in an otherwise regular growing season simply by eating the garlic.

Bad weather is also a concern in a world of changing climates – too much frost or rain will freeze or drown a crop before harvest. This has happened with other crops

in recent months, with flooding causing serious losses among potato, lettuce and kumara crops. However, garlic seems to have avoided most of the rough weather thanks in part to Marlborough's reliable climate.

#### **Exports to the Pacific**

Most garlic grown in this country is eaten domestically, although some does get exported. Almost all of New Zealand's exported garlic is sent to the Pacific Islands. Exports in 2016 had a value of \$900,000 compared with \$600,000 in 2015. The value of the domestic market in 2017 was \$7 million. New Zealanders have expressed a great desire for locally grown produce across the board and garlic is no exception to this.

#### **Health benefits**

Throughout history, garlic has been the topic of many old wives' tales and folklores, from keeping vampires away to curing anaemia. Superstition aside, recent research has shown that the entire onion family, but particularly garlic, does have some properties that destroy bacteria and protect against heart disease. Its low calorie-high nutrient quotient also makes it very attractive to the modern, health conscious consumer.

Horticulture New Zealand's vision is one of 'healthy food for all forever'. The garlic industry in this country exemplifies this mantra, producing sustainable, responsible, affordable produce for everyone.

*Brian McDonald is Communications Advisor with Horticulture New Zealand. Email: [brian.mcdonald@hortnz.co.nz](mailto:brian.mcdonald@hortnz.co.nz). **J***



# SAFFRON

## - AN EMERGING INDUSTRY

**Saffron growing is an emerging industry in this country and this article looks at plant characteristics and how it is grown and marketed commercially.**

### Saffron plant

*Crocus sativus L.* is a member of the family *Iridaceae*. The spice known as saffron is derived from the three-pronged red stigma of the flower, which is extracted by hand from the flowers and remains intact, then dried. Once prepared correctly saffron has an extremely long shelf life when kept in an airtight container, away from heat and light.

The crocus corms multiply rapidly, vegetatively, not requiring pollination. It is necessary to uplift and replant the corms on a three-year rotation to avoid overcrowding in the beds. Attention to weed suppression is required, but throughout the dormant period over summer minimal labour input is required. Corms can be fed with natural organic plant-based fertilisers and organic compost is used for weed suppression and mulching.

### Growing conditions

Saffron is currently grown in the central and east coast of the North Island and through the centre and east coast of the South Island. Areas of New Zealand suited to saffron cultivation include coastal dry areas, high country and areas prone to drought.

Land is not required to be high in nitrogen or particularly fertile as the crop is foliar fed through the season. Land that is perhaps deemed unsuitable for traditional intensive

farming would be suitable for saffron cultivation. Irrigation is not required by the crop, although it does benefit the flowering to receive a small amount of rain beforehand. The corms enjoy baking summers and frost in winter.

**Land that is perhaps deemed unsuitable for traditional intensive farming would be suitable for saffron cultivation.**

Saffron is a good companion crop for land surrounding vineyards or orchards, as the autumn flowering time would be following the harvest of those crops and finding labour for picking is therefore easier.

Saffron has thrived in our Southland climate, enjoying the chilling in winter. For us, it grows well on an elevated site with full sun and good drainage. In late 2015, we planted a further 130,000 corms, bringing the total area in production to around one hectare. As an autumn flowering crop, the drop in soil temperature promotes growth and flowering in April. The flowering season lasts around 45 days. Well-drained soils must be used for its cultivation, and all day sun and a pH level of 6-8 is recommended. Land must also be well cultivated prior to establishment of the saffron planting.



Saffron corms



Saffron cultivation

**Currently there is no national body linking saffron growers, but hopefully in the future this will happen. This would enable a cohesive approach to marketing and help individual growers to research and share knowledge.**

The extreme levels of UV light in Southland has elevated all the properties in our saffron. Annual testing to ISO standards has proven extremely elevated (300+) crocin levels, the chemical responsible for colour intensity. Flavour and aroma is also greatly enhanced. Testing has validated that the product contains no synthetic dyes or additives, which are common with imported saffron, and also proves it is of pharmaceutical grade.

Saffron can suffer from botrytis and corm rot if the soil is too wet for extended periods, and both can be controlled using sulphur preparations. Spraying with Neem oil deters grass grub if the crop is planted in areas prone to that pest. Rabbits do like saffron foliage and can dig up corms. Rabbit fencing is useful in rabbit-prone areas.

#### **Picking and labour costs**

Picking is labour-intensive as flowers are produced daily and this is done by hand. Several pickings a day may be required. Overseas, saffron is picked then dried by traditional means, either by air or oven, resulting in inconsistency of the end product. Instead of discarding flower petals they can be used as compost on the beds. The petals can be dried as an added value product and are sought after for a multitude of uses in natural cosmetics and by naturopaths.

Seasonal labour costs in New Zealand are prohibitive, but in our venture we take part in the WWOOF (World Wide Opportunities on Organic Farms) programme. The help of volunteers is invaluable as they wish to learn about the saffron growing process and increase their skill base in horticulture. It is beneficial to both parties to share knowledge and spread the word about New Zealand grown saffron.

Challenges facing New Zealand growers are labour costs for harvest and maintenance, high freight costs for sourcing bulk product, and costs of certification for small businesses getting established.

#### **Variety of uses**

Saffron is mostly used for the flavour and intensity it brings to dishes and can be in thread form, powdered or an infusion. It is also used for natural cosmetics and is being explored for pharmaceutical purposes. Research is currently being carried out into the benefits of saffron for Alzheimers disease, as an antidepressant, for macular degeneration of the eyes, reducing anxiety, as an antioxidant, pain relief, an appetite suppressant, arthritis, treating coughs and colds, and for stomach disorders.

### **Organic certification, provenance and sustainability**

Chemical analysis has shown the presence of more than 150 components in saffron stigmas, including crocin, crocetin and safranal. New Zealand is well known worldwide as a producer of safe, clean food. Saffron growers can become part of the BioGro network in this country, which has levels of certification that can be obtained. A grower can aim to produce certified saffron to the highest Category A1 plus, which is tested to ISO standard 3632 2, as well as being rated for the crocin high colour intensity level.

Consumers are also now much more aware of the provenance of food, traceability and trust in the origin of products. Organic standards can give consumers confidence, along with stringent food safety regulations. Climate change and changes to overseas import restrictions may affect the choices of and ways that crops are grown in New Zealand in the future.

Growers can also ensure their packaging is recyclable and production sustainable. The processing is minimal, requiring only dehydration, and the end product is 100% pure. Saffron cultivation does not require a large amount of heavy machinery investment – on a commercial scale only a tractor, planter, lifter for corms and grading machine.

### **Domestic and export markets**

As many people are hobbyists their production is unknown, with owners growing for their own use. There are currently about five commercial five growers and total production in New Zealand is approximately 10-15 kg per annum. As the general public has increasing knowledge about saffron we have noticed a rise in the demand for corms to be planted.

Originally the total saffron crop from our venture was exported to Tasmania, but is now sold mainly in New Zealand to supermarkets and other stockists, as well as to overseas customers. Domestically, our premium grade saffron is very well received and used in a large number of restaurants, cafes and health food stores who embrace the use of local produce.

Iran produces 90% of the world's saffron. Spain, Afghanistan, Morocco and Greece contribute the balance, so the fact that saffron is grown in New Zealand is unusual. Overseas producers have the benefit of a plentiful and cheap labour force. Demand from overseas far outstrips supply available here and importers request supplies by the tonne, but it will be some years before we can supply this amount. The industry is growing slowly and it is still in the boutique market category. We would like to see our neighbours in the Asia Pacific area explored as a market for saffron, for both culinary and medicinal purposes.

### **Lack of a national body**

Currently there is no national body linking saffron growers, but hopefully in the future this will happen. This would enable a cohesive approach to marketing and help individual growers to research and share knowledge.

*Steve and Jo Daley are owners of Kiwi Saffron NZ Ltd based at Te Anau. The business was purchased four years ago from Ray Hughes and Cheryl Rault, who were the pioneers of the organic saffron industry in New Zealand, having grown it commercially for over 20 years. Email: [info@kiwisaffron.com](mailto:info@kiwisaffron.com). *



Saffron flower

Chemical analysis has shown the presence of more than 150 components in saffron stigmas, including crocin, crocetin and safranal.

# CREATING ALTERNATIVES TO MEAT AND MILK PRODUCTS



**The appetite for alternative meat and milk proteins appears to be gathering momentum among a more diverse eating culture. Is it time for New Zealand to make the next big leap and seek out its own alternatives?**

#### **A trend away from meat**

The recent introduction of the first lab-grown hamburger, which is produced from cultured meat, will be of interest and concern to meat producers globally. This discovery prompts us to think deeply about the future of New Zealand meat industries and ask these questions:

- What drives consumers to base their main protein intake from meats, plants or even insects?
- How will consumers perceive novel or unfamiliar meat and milk alternative products if they are produced and presented in a way that is more acceptable to them?

Some global consumers enjoy meat and milk products, others the crunch of insects, or the unique sensory properties of tofu, hummus and falafel. For some, plant-based foods are their only realistic option. One hundred grams of protein from crops generally take far less water and natural resources to grow than one hundred grams of meat. As such, some regions of the world are more suited to growing crops instead of raising animals, skewing the local population's diet in that direction. Some cultures treat livestock as prized possessions, to be killed for meat

only on special occasions, or passed between families as dowries. In such cultures, it is more practical to consume protein from plant sources. Thus, the global consumer drivers are diverse and varied.

Shifting away from animal-based proteins, such as meats and milk to plant-based proteins, has become a trend in western diets. This movement is due to consumer choice and perceptions driven by social, ethical and environmental concerns. Some will not eat animal products because of animal welfare concerns. Others will not consume them because they believe raising livestock causes environmental damage, such as the pollution of rivers and the creation of methane, a greenhouse gas. Some may be vegetarian or vegan for religious and/or social reasons.

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**One hundred grams of protein from crops generally take far less water and natural resources to grow than one hundred grams of meat.**

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**Insects are an interesting source of protein, because it takes even less water and natural resources than plants and animals to grow for the same quantity of protein.**



Whole locust insect (L) and ground locust powder (R): Photos: Courtesy of Claudia Clarkson

The research community and the food industries have therefore been putting much effort into exploring the use of plant-based proteins and finding novel protein sources, such as from insects and algae, to replace animal-based proteins like meat and milk.

#### Exploring plant proteins

An animal-based protein, such as eggs, meat, milk and seafood, is known as a 'complete' protein source because it contains all the 21 amino acids. In comparison, plant proteins are 'incomplete' because they lack, or do not have enough of, certain amino acids. This deficiency must be accounted for by consuming a variety of complementing protein sources. Since humans cannot synthesise nine out of 21 amino acids, they need to source these from their diet to maintain optimal health.

While plant protein may not be a complete protein, it has been a part of the human diet for millennia in both minimally and extensively processed forms. The earliest extraction and processing of plant protein came from soybeans. The creation of a myriad of products from it, such as tofu, tempeh and soy milk, can be found in the Central and Southeast Asian cultures and tofu has been a widely accepted product in the western diet. In the Arabic and Indian cultures, hummus and falafel made from chickpeas, and curries made with dhal or split lentils, are popular.

Consumers are demanding more variety in plant-based foods. Western businesses also use different marketing strategies to promote existing plant-based foods, for instance, trying to make more creative products such as an Asian tofu burger or meatless burgers. Various food processing technologies and product formulations have also been developed to make new products that mimic meat and milk products. For example, meat texture-like soy proteins have been created from wet extrusion to increase their appeal.

Apart from legumes, another source of plant protein is from seeds and tree nuts. Substituting animal-based milk with various plant milk products has seen a wide variety of products available in the global market, such as soy milk, coconut milk, rice milk, almond milk, hazelnut milk, cashew milk, hemp milk, and recently flaxseed milk. This is helpful for those who may be lactose intolerant and cannot consume bovine milk.

#### Exploring unfamiliar sources of protein

##### **Insect protein**

But where else can we find protein, if not in animals or plants? Although it is tempting to continuously improve the production of animals and crops to feed the growing world population, humanity cannot afford to not look elsewhere and the first place to find dietary protein is



*Legumes and nuts products at traditional Chinese market in Shanghai*

**Another potential alternative to animal proteins is being developed in New Zealand in the form of isolated wool protein. The use of wool protein as a food ingredient is currently being investigated.**

insects. Insects are an interesting source of protein, because it takes even less water and natural resources than plants and animals to grow for the same quantity of protein.

Insect protein is considered an emerging and niche protein source in the west, but we are only just beginning to find out more about it. Studies on the amino acid profile of insect profile are ongoing and the current literature indicates that this profile is for a 'complete' protein. However, scientists are still not entirely sure how the human body reacts to or will utilise insect-based protein.

Traditionally, insects have been consumed in many cultures as food, but not as a staple. They are eaten as snacks or supplements to the main diet more than anything else. Some Asian countries, such as Thailand, have launched packaged baked insects as snacks. Unfortunately, from a marketing perspective, while they are enjoyed in many cultures insect products can cause an involuntary feeling of fear and even disgust in western consumers.

To counteract the revulsion felt by many at the sight of whole insects, it is possible to process them so they no longer have wings, legs or antennae by producing insect flour, such as ground cricket flour which contains 60-70% protein. Commercially available insect protein isolate is still limited and can only be obtained from specialty and online stores at a premium price. This is because even though resources used in their production is low, the demand and economy of scale has not been achieved to bring the price down to a competitive level.

However, entrepreneurs have been creative at making products based on insect proteins. For example, protein bars made from insect proteins are marketed as a nutritious, delicious and environmentally responsible protein source for athletes, and some chefs have incorporated ants into gourmet ice-cream.



Plant protein products sold on the same shelf as whey protein products

### Wool protein

Another potential alternative to animal proteins is being developed in New Zealand in the form of isolated wool protein. In considering animal, plant and insect proteins, the perspective has always been to create more protein with less resources. Wool protein is a source of protein from, arguably, waste. Wool processing has waste, and the waste has protein. Could that protein be efficiently extracted to create innovative protein products? The use of wool protein as a food ingredient is currently being investigated.

### Price point

Scientific concerns aside, the main economic challenge now in putting insect or alternative protein into the western human diet is the price and availability. Until they are more accepted by consumers, thus increasing the supply and the decreasing price, they may remain at the fringe of consumer demand.

### How does science fit into this?

The obstacles facing alternative protein sources, and the wider area of food security, are constantly being tackled through research and technology. New methods for creating more nutritious, minimally processed foods in greater yields are constantly being explored:

- In the livestock industries, scientists are looking into translating one tonne of plant feed into the maximum amount of meat
- In the plant foods industries, current research is ensuring the plant protein consumed by humans is in the most digestible and beneficial form possible.

Scientists are working hard on studying the potential of alternative sources of protein, such as insects and wool, and incorporating them into our diet. It will be the combination of scientists, industries and governmental bodies working together that will create acceptable and sustainable alternative protein foods.

The final challenge outside the production aspect is ensuring we are not venturing blindly into the unknown. Cooperation from the public health sector will greatly accelerate our knowledge of the long-term effects or unexpected health impacts of consuming alternative proteins. For example, the mismanagement of providing incomplete protein can lead to amino acid deficiency and insect protein is yet to be fully understood.

### Diversification to feed a global population

For New Zealand, the heavy emphasis on the dairy and meat industries has built a world-class reputation for its exported produce. However, diversification is needed to ensure sustainability of the soil, the environment and, ultimately, the future. Increasing meat production through efficient meat extraction and waste minimisation will allow greater resources to be diverted to alternative protein production, be it in the field of environmentally-friendly nitrogen-fixing crops or theoretical domes of sustainable and cheap locusts and crickets. It is through this that New Zealand, and the world, will eventually be able to feed its population a wide, diverse and balanced diet for optimal health.

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# GUY BLUNDELL

IMMEDIATE PAST PRESIDENT

### Wairarapa background

Guy grew up in a third generation sheep and beef hill country farm in the Wairarapa, 45 minutes east of Masterton. He attended Rathkeale College in 1987 and spent his summers on the farm in crutching gangs and doing other work. After leaving high school he spent two years shepherding on the east coast before attending university.

His love of farm work further sparked his interest in agribusiness, and prompted him to take up a Bachelor of Commerce major in Farm Management and Rural Valuation at Lincoln University in 1994. After his degree Guy established a farm leasing business with his brother in the Wairarapa, which involved leasing a 1,000 ha farm near the coast east of Martinborough.

### Overseas experience

In 1998, he moved overseas where he worked in Canada for a New Zealand pet food exporter. In 1999, Guy moved

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**During his more than five years at Baker & Associates he worked with large-scale family and corporate farming entities on services such as financial reporting, business structures, and the establishment of advisory board structures.**  
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to London and worked for Newton Asset Management (a global investment management subsidiary of the US fund manager BNY Mellon) under a short-term contract. Shortly after, he assumed the role of European financial controller at Mindshare Media, part of the communications services group WPP, until 2002.

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## Consumers are becoming more conscious of farmers' social responsibility to produce sustainably. There appears to be a disconnect for many growers about what this might mean in the long term for demand and pricing.

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While working at Mindshare he was responsible for foreign exchange exposure mitigation, Pan-European client profitability analysis, and the reporting for all its European business operations.

In mid-2002, Guy moved to The Netherlands to take on the role of financial accountant for the European head office of Nike, where he was part of the project team for the systems integration from Oracle to SAP. He also handled the control and recharge of intercompany charges between Nike USA, Nike Europe, and other European, Middle East and African (EMEA) countries.

### Return to New Zealand

After working in corporate accountancy roles overseas for a couple of years, Guy returned to New Zealand to pursue his passion for agriculture. He initially joined and became a partner at Baker & Associates Ltd, where he leveraged his finance background and agribusiness expertise to drive value for the business.

He used his solid knowledge in agribusiness to develop and implement practical systems for the sheep, beef and deer sectors of New Zealand's farming industry, while applying his finance and accounting skills to establish financial management and governance structures for clients. During his more than five years at Baker & Associates he worked with large-scale family and corporate farming entities on services such as financial reporting, business structures, and the establishment of advisory board structures.

### Current role

As the latest career endeavour he has embarked on, Guy founded Compass Agribusiness Management Ltd in May 2009 and he is the managing director. This combines his deep understanding and skills in agribusiness management, sustainable agriculture, and finance and accountancy. Compass provides tailored full management solutions for passive investors who want to invest in developments related to agriculture.

Compass has offices in Arrowtown, as well as Melbourne and Hobart. Guy currently works with a client base in New Zealand, particularly in Southland and Otago. As managing director he provides governance support, implements farm business systems while ensuring sustainable farming practices and business growth, helps raise capital for large-scale agricultural businesses in New Zealand, and devises the company's expansion strategy in New Zealand and Australia. At present, his company manages agricultural assets totalling approximately \$140 million in both countries.

### Directorships

Apart from his role at Compass, Guy has also taken on directorships at company and advisory board level for more than a dozen agriculture-related entities to aid in sound decision-making. As well as being a director of the Centre for Dairy Excellence in Geraldine, he is also on the boards of Headwaters NZ, The New Zealand Sheep Company, Tarras Farm and Southern Ranges. Guy is also a member of the New Zealand Institute of Directors and the New Zealand Institute of Management, and is also a member and the immediate Past President of the New Zealand Institute of Primary Industry Management.

### Further education

Since 2005, Guy has graduated with qualifications from five organisations and institutions: the Rabobank Executive Development Program for Primary Producers 2005 (Sydney); the Massey University Nutrient Management Program 2006; the Harvard Business School Agribusiness Executive Program 2013; the Institute of Directors' Director Development Program 2014; and the Melbourne Business School (Advanced Management Program) 2017.

### Reflections on New Zealand agriculture

In his view New Zealand has to become more aware of what our brand image can do for us, both positively and negatively. He says our over-intensification and resultant environmental impact will affect market access and, at a minimum, negate our ability to premiumise over time. Consumers are becoming more conscious of farmers' social responsibility to produce sustainably. There appears to be a disconnect for many growers about what this might mean in the long term for demand and pricing. Technology to mitigate some of these aspects will help, but he believes management changes will have the biggest positive impact.

Guy also feels we have the opportunity to be the premium food producer in the world, but we have a good but under threat reputation about how we farm. We need to move our mindset to be the artisan food-producing nation of the world. This is about producing the best products globally given food scarcity, and selling less for more with the lowest environmental footprint. He also believes we need to follow in the footsteps of innovative companies, such as Firstlight Foods Wagyu programme and Headwaters Te Mana Omega Lamb, as these are great initiatives that premiumise a product category through technology, branding and differentiation. **J**

***Building the capability and capacity  
of Rural Professionals***



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