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Sheep meat in China

Growing labour productivity

Maori agribusiness

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Julian Bateson

We need a Minister for all primary industries

The new Minister for Primary Industries has only just got his feet under the metaphorical table. However, it would be good to know if he has a wider view of primary industry in New Zealand than his predecessor – referred to by some as the ‘Minister of Cows’. There is no question that dairying is a very important part of New Zealand’s economy, but it was revealing to see where the rest of primary industry sat in the memory of the last Minister. Just after his resignation was announced there was a comprehensive interview about his work, published in the *Dominion Post*. In this long article I was unable to find the word forest or forestry once. He mentioned horticulture on only one very brief occasion.

Forestry and horticulture are very large parts of the domestic and export industry and we need a Minister to be as involved in these as in the dairy industry. Forestry in particular seems to be almost completely ignored. Timber is a very large export earner and we are also going to need a lot of wood for the Christchurch rebuild. This is not forgetting how important trees are to prevent erosion of vulnerable hill land as the climate changes. Let us hope we get a Minister for all primary industries.

This issue of *Primary Industry Management* as usual covers a variety of topics. Keith Woodford and Xiaomeng Lucock present a valuable look at the possibilities for exporting more sheep meat to China. The Muslim population in China is expected to more than double in just over 15 years to 30 million. The lamb produced by New Zealand could be a welcome addition to their meat consumption instead of the more available pork which, of course, they do not eat.

Employment and labour productivity in agriculture are covered in two other articles. Rapid growth in the dairy industry has produced significant problems finding good staff. Immigrant employees are showing the way by being willing to work with a good attitude. We have a lot to learn from them. The article by John Fegan gives us an interesting insight on this topic.

Maori agribusiness is a significant part of primary industry with Maori commercial assets in agriculture, forestry

and fishing estimated to be worth over \$10 billion. This accounts for over \$1 billion towards New Zealand GDP with Maori agribusiness worth around 10 per cent of the sector. This is not just a recent success and a result of Treaty money. As far back as the early 1800s, Maori endeavours included significant agricultural ventures such as flour-milling and saw-milling, as well as being directly involved in overseas international trade. Yes, we are still talking pre-1850.

Animal welfare and the need to pay good attention to it is presented in an article by Jim Webster. Ethical food production is becoming more important and consumers are prepared to pay a premium. Knowing that food can be tracked to source can be a benefit, and perhaps a disaster if it proves that the rules are not being followed. The current discovery of horse meat mixed with beef, or instead of beef, in Europe has brought out the importance of knowing that the food you eat is exactly what it is supposed to be. Making sure animals in food production are well treated should go without saying, but proving it is also important. New Zealand should regard it as a cost of doing business and an opportunity to add value.

The DairyNZ article about Dairybase is well worth a study even though it is quite long and packed with graphs. Setting standards to work to, benchmarking in the current jargon, is a valuable way of finding out where you are in a business. With DairyBase there seems to be a very good system to compare with its peers how well a dairy farm is doing.

Being an expert witness is never an easy task. A recent complaint against a Registered Member who had given evidence as an expert witness is reviewed in an article by David Baker. He makes it clear that, when acting in the capacity of an expert witness, a member of NZIPIM must display an unchallengeable level of impartiality and professionalism.

I hope you find this issue of *Primary Industry Management* as stimulating as usual. If you would like to contribute an article to a future issue, please get in touch.



Keith Woodford and Xiaomeng (Sharon) Lucock

Sheep meat in China and the opportunities for New Zealand



In 2012, China replaced the United Kingdom as the most important destination by volume for New Zealand sheep meat. In this article we explain the reasons behind the increased demand, and look at what the future might bring. Main issues relate to degradation of the Chinese grasslands, the high opportunity cost of raising sheep on arable land, increased consumer demand for sheep meat, and the challenge of moving from commodity sales to consumer-ready products.

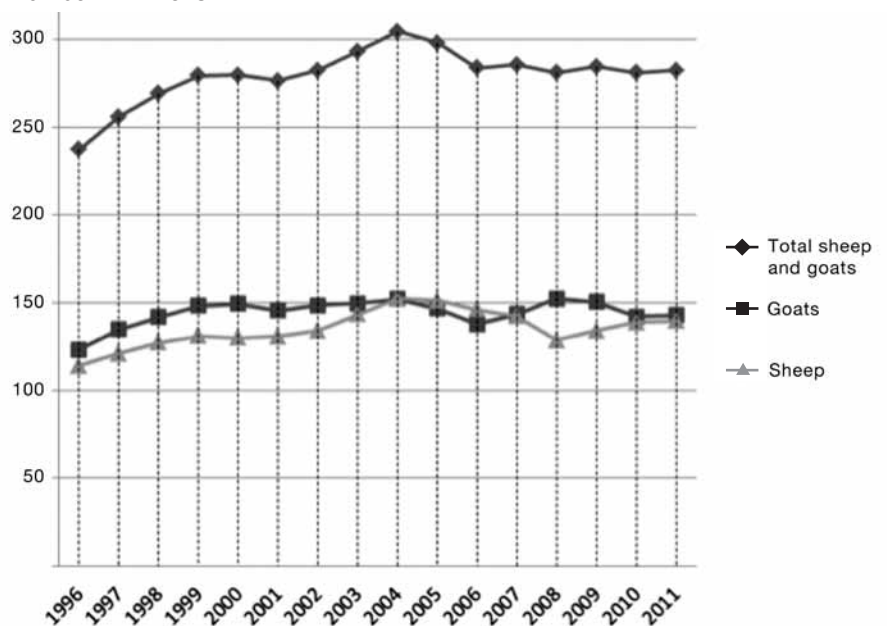
Chinese sheep and goat production

Statistics on Chinese sheep and goat production can be confusing given the general lack of discrimination within the Chinese language between sheep and goats. Sheep and goats are recorded separately when they are livestock, but there is no distinction in the recorded statistics or in Chinese cuisine once they become meat. The term 'yang rou' 羊肉 covers lamb, mutton, kid and goat meat.

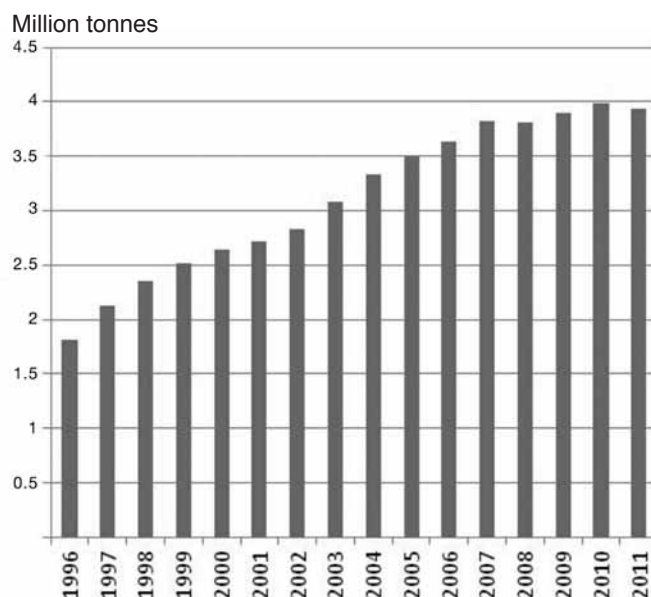
Data from the National Bureau of Statistics of China show sheep numbers increasing from 114 million in year 1996 to 152 million in 2005, and then declining back to 140 million in 2011. Goat numbers also increased from 123 million in 1996 to 152 million in 2005, then declined back to about 143 million in 2011.

Whereas sheep and goat numbers increased only 19 per cent between 1996 and 2011, meat production from these flocks more than doubled during this time from 1.8 million tonnes to 3.9 million tonnes. However, much of the production is eaten

Number in millions



Sheep and goat populations in China



China's sheep and goat meat production

by Muslim communities in the pastoral areas, and therefore does not enter formal supply chains. It is therefore inevitable that volumes will be estimates rather than measured, and there is also scope for confusion between bone-in and bone-out.

The Chinese grasslands

The Chinese grasslands cover much of western and northern China. The main pastoral regions for sheep production are in Qinghai, Xinjiang, Tibet, Gansu and Inner Mongolia. Sichuan and Yunnan also have pastoral areas. Traditionally, the pastoral areas are where most of China's sheep have been farmed with only small numbers of goats. Sheep farming is usually associated with a nomadic lifestyle and movement between summer and winter pastures.

The grasslands are usually at high altitude, nearly all above 1,000 metres and often higher than 3,000. Winters are bitter and the no-growth period often exceeds six months. Average rainfall in many regions is less than 300 millimetres



Degraded grasslands in Inner Mongolia

and seldom more than 500 millimetres a year.

The Chinese pastoralists are mainly ethnic minority people for whom the 'one child' policy has never applied. As a result, there is over-population both of people and animals.

The government of China has responded to the grassland degradation in many ways. In the north, all sheep have been removed by edict from parts of Inner Mongolia. Out to the west on the high altitude Qinghai grasslands, there is a conservation region of 350,000 square kilometres, more than the total area of New Zealand, where all pastoralism is according to organic systems. However there is a lack of local legumes and the only ones to have survived the over-grazing are poisonous to livestock. Combined with the depredations of pikas, small rabbit-like burrowing mammals, the continuing removal of nutrients in animal products and no artificial fertilisers leads to continuing degradation problems.

The general outlook for increased sheep production from the grasslands alone is therefore poor. However, on recent visits to Qinghai we have seen Tibetan sheep being housed for finishing before slaughter. These sheep are fed pellets made from mixed straw and grains. This intensive finishing may become of increasing importance in an attempt to at least maintain production levels.

Sheep and goats in the arable provinces

There are large numbers of goats and sheep raised in what are called arable provinces. However, a lot of the areas where the goats are raised are mountainous. Nevertheless, the climate is considerably warmer than in the pastoral provinces. The five most important arable provinces for goats are Shandong, Hebei, Henan, Anhui and Sichuan. In these provinces the majority of the 'yang' are goats rather than sheep.

In contrast to the grasslands, the Chinese government is trying to encourage both sheep and goat production on the arable lands. This production is often in association with



Sheep in association with cropping, Inner Mongolia

crop stubbles. However, the opportunity costs of sheep and goat production are high, except when they are on what would otherwise be wasteland.

In some ways it is little different from the situation in New Zealand, Australia, Europe and South America where most of the sheep farming takes place on land for which there are few farming alternatives. Although there have been considerable increases in the past, there are therefore unlikely to be further large-scale increases in the future.

Analysis of the five major arable provinces where goats and sheep are raised indicates that production in these areas has actually been declining since 2006. In all, there are close to two million farmers who have sheep and goat flocks, but the number of farms is declining as farmers move to the cities and with some farm aggregation occurring.

Chinese sheep and goat meat consumption

FAOSTAT, the Statistics Division of the Food and Agriculture Organisation, food balance sheets for 2009, show Chinese per capita consumption of sheep and goat meat of 2.9 kilograms a year. This consists of five per cent of total meat consumption. It is more than three times the per capita consumption in 1990. In comparison, New Zealand per capita sheep and goat consumption, although still much higher, has declined to 23 per cent during this time.

Chinese and New Zealand meat consumption in kilograms per person each year

	China 1990	China 2009	NZ 1990	NZ 2009
Sheep and goat	0.9	2.9	30.0	23.2
Beef	1.0	4.8	39.1	27.6
Poultry	3.3	12.6	16.6	30.4
Pork	20.2	36.7	13.6	21.8
Total meat	25.7	58.2	100.1	106.4



Housed Tibetan sheep in Qinghai Province being intensively finished for the market

Sheep and goat meats in Chinese cuisine

The best known form of sheep and goat meat consumption is as thinly sliced ‘yang’ roll within the customary hotpot cuisine typical of northern and western China, but also seen elsewhere in the rest of the country. The hotpot containing soup with basic flavouring spices is brought to the table and placed on a burner. At restaurants the guests are provided with the other ingredients of meat, vegetables and tofu on trays and they then add these to the hotpot.

Only a few minutes of cooking are required. For this style of cooking, customers often prefer meat with plenty of fat for better flavour, and therefore there is no price discrimination even for extremely fatty meat. Meat from older animals may also be preferred on account of the stronger flavour.

There are also many other forms in which sheep and goat meats are consumed within Chinese cuisine. A simple search of ‘sheep/goat meat recipes’ in Chinese 羊肉菜谱 on Google reveals vast numbers of dishes using sheep and goat meat. One website alone www.meishichina.com offers 161 recipes for ‘yang rou’.

Generally the recipes use minced, diced or chopped pieces often bone-in, and are presented as stir fries, roasted pieces, dumplings, kebabs and in casserole-type dishes. Food plates are almost always placed in the centre of the table for communal use. Knives and forks are never available in China, unless Westerns are being catered for, and so food needs to be in a form suitable for eating with chopsticks or hands.

A lot of Chinese retail products do contain English language labelling as part of the marketing image. There can be use of specific words such as lamb and mutton which implies differentiation between the two. However, it would be unwise to assume the different words have any particular significance.

New Zealand sheep meat exports

Historical information on sheep meat exports to China is less than accurate. This is because in the past some of the meat was sold to buyers who would first ship it from New Zealand to a third country, and then re-export it to China via grey unofficial channels.

However, increasing numbers of New Zealand slaughter and processing plants are now registered by the Chinese government. Together with declining tariffs ranging from four per cent to 7.5 per cent in 2013 and declining to zero in 2016, and with jail sentences in China for those caught in the grey trade, the incentive for trading this way has greatly reduced. Nevertheless, there is in all probability still some sheep meat sold into China this way, with Hong Kong in particular as an intermediate point.

Trade increase

New Zealand export data show that the sheep meat trade has increased greatly in recent years. The NZ Meat and Livestock Authority reports that on a volume basis, exports to China increased from eight per cent of sheep meat exports in the year ending June 2010 to 12 per cent in 2011 and 18 per cent at June 2012. Volumes have increased again for the first part of the 2012/13 year.

Until recently, most of the trade was in lamb and mutton flaps which were processed into 'yang' roll. However, to meet the demand the Chinese buyers are now purchasing a much greater range of cuts from old ewes together with lamb forequarters. Some of the Chinese companies use brands such as 'Kiwi lamb' but the Kiwi provenance is far from guaranteed.

It has also been a common practice in the past for Chinese processors to mix in some cheap pork or duck fat to reduce the cost of the product. However, China is now placing high priority on improving food quality, and adulteration of this type will increasingly be a risky strategy for any local Chinese processors who persist with this practice.

From a New Zealand perspective, one of the strengths of the Chinese market has been that there is a high regard for what New Zealanders see as the lower quality cuts. Part of the profitability of the New Zealand sheep industry in recent years has been because of better prices for these so-called inferior cuts caused by demand from China. The influence has been particularly strong for ewe mutton for which other options have been limited. The Chinese market has therefore become complementary to the European and American markets which favour the premium cuts from young animals.

The supply chain from New Zealand

Most of the sheep meat sold to China is purchased free on board, that is dockside in New Zealand, by the Chinese buyers. The Chinese purchase the meat in a minimally processed form. Therefore the New Zealand meat processing companies receive commodity prices. Generally the meat



Kiwi lamb as marketed by a Chinese company after processing in China



Sliced Kiwi lamb roll in Shanghai supermarket



Final stage processing of sliced lamb roll in supermarket

is then shipped to the port of Dalian on China's north east coast and then transported to the far northern city of Harbin. There the meat is thawed, boned out, processed into mutton rolls, and frozen again for the next stage of its journey.

It is then transported throughout China to be sold both in supermarkets and to the food service industry. There is still one further step in the processing before retail sale. The frozen mutton roll is sliced very thinly and then placed in consumer trays in chiller cabinets with this final stage often occurring in the supermarkets.

Retail prices of mutton roll in late 2012 ranged from about CNY24 to 37 for a 400 gram pack, equating to about NZ\$12 to \$18 a kilogram. This was between two and three times the price of pork and chicken, and similar to sliced beef roll processed in the same way. Mutton roll prices have increased about 40 per cent between 2008 and 2012.

New Zealand initiatives

Several years ago there was a major initiative by some of the New Zealand meat marketing companies, together with the New Zealand industry body Beef and Lamb to work together in developing the Chinese market. However, the initiative failed while still in the gestation stage. The focus was on the high-end food servicing market, and it quickly became apparent that the volumes would be small.

One of the major players then withdrew, and the project fell apart. The report has never been released, but it seems that the initiative got off on the wrong track right from the start from a fundamental failure to recognise main distinguishing features of Chinese cuisine and the Chinese market.

There is an irony that the Chinese market has developed in spite of, and not because of, any grand New Zealand initiatives. Instead it has been because the Chinese buyers came looking for the product from New Zealand. Nevertheless, at least two New Zealand companies are now shortening the chain and attempting to sell branded product into high-end restaurants, although apparently only in small volumes.

Some current concerns

There is debate within the meat industry as to whether the New Zealand-China Free Trade Agreement is working as it should. Some processing companies have all of their plants registered for China and find the trade works very smoothly, but other companies have been frustrated by the bureaucracy.

There are certain subtleties by which the game has to be played. This could be incorrectly interpreted as meaning that bribes have to be paid. However, that is not the case, and many foreign firms who are successful in China across a range of industries are adamant that if you are paying bribes then you are working with the wrong partners.

A more correct interpretation of 'the game' is that officials who get upset or offended can be impossible to deal with and memories are long. Threats and bullying are definitely not how the game should be played, and once 'face' has been lost then the position can be irrecoverable.

The future

An important issue is that China produces about four million tonnes of sheep and goat meat, which is 10 times our total New Zealand production. Their own ability to increase production is constrained by fundamental problems. In terms of global competition for New Zealand in this market, there is no one out there of any significance apart from Australia.

Overall meat consumption in China continues to increase, but much of this is pork and to a lesser extent poultry. However, there is a substantial Muslim population of about 23 million whose religion forbids the consumption of pork. This population is projected to increase to 30 million by 2030. The overall Chinese economy continues to grow at between seven and eight per cent a year, and within this growth most commentators expect a further shift from investment to consumption.

Challenging alternatives

An important question has to be whether or not New Zealand is getting the full benefit from the Chinese sheep meat trade, given the long supply chains. The trade works nicely for the Chinese processors and marketers who earn the entrepreneurial profits, but the return to New Zealand is a 'free on board' commodity price. However, the alternatives would be challenging. Distribution channels into supermarkets are complex, because unlike New Zealand the Chinese supermarkets do not have central distribution centres.

One alternative is to further explore the notion of online selling direct to consumers. Increasingly, Chinese consumers are buying this way, including chilled and frozen food which is delivered directly to apartments. Within New Zealand, there is discussion about an integrated 'New Zealand Inc' approach to marketing our food internationally.

Imagine the synergies from our branded New Zealand food products being marketed online to Chinese consumers from an integrated New Zealand Inc online platform with food baskets containing meat, fish, dairy, wine, fruit and vegetables. This would all be directly delivered from China-based distribution centres to consumers in the Tier 1 and Tier 2 cities of China, and with guaranteed provenance. The individual elements of the supply chain are essentially all in place, but the commitment of New Zealand agri-food companies to work together and make it happen is not there yet.

Keith Woodford is Professor of Farm Management and Agribusiness at Lincoln University and has been visiting China periodically since 1973. Xiaomeng (Sharon) Lucock is a Lecturer in Agribusiness Management at Lincoln University. She was born in China and moved to New Zealand in 2002, and is currently studying cross-cultural business relationships within New Zealand and Chinese agri-food industries.

Data for the diagrams and charts was supplied by FAOSTAT and by the National Bureau of Statistics of China.

John Fegan

The changing face of the New Zealand dairy farm employee

I first became involved in the New Zealand dairy farm labour market on a professional level in the early 1990s and have been heavily involved ever since. Over this time I have seen what can only be described as dramatic and sustained change – a revolution rather than an evolution.

The 1980s and early 1990s were characterised by small farms which employed either no external labour or just one employee. That employee was usually a farm cadet, between 16 and 21 years old, and they lived-in with the employer. The farm would milk 300 to 400 cows.

During this time the biggest challenge was to encourage employers not to make their cadet redundant in February after the employer had taken their Christmas break. Employers were unable to see the long-term damage caused by making a young employee redundant in February. The reality was that those employees would not be able to find another farm job at that time of year, so ended up going to work in town and invariably did not return to farming.

Conversion waves and staffing shortfalls

Then along came the conversion waves. It started in Canterbury in 1992 and in Southland a year later and has not stopped. There was a brief respite for one season when NZ Dairy Group put a moratorium on conversions, and again in 2008 with the global financial crisis bringing growth to an abrupt halt. However, from a staffing perspective, since 1992 the industry has had a demand for staff greater than supply for every year except two. It has only been the size of the shortfall which has changed each year.

To add to this challenge we also now have a drain on the New Zealand farm staff supply to overseas dairy farms, some driven by New Zealand farmers converting in Australia, the Americas and to a lesser degree in Asia. Initially the greatest shortfall was at the junior level and this spread into medium and senior levels. However, in the pull overseas has now generated a real shortfall at senior level of farm manager or operations manager.

Challenges

With this rapid and sustained growth we have encountered some real problems when it comes to staffing. The first of the bigger problems is desperation, leading to employing undesirables in the industry. The whole industry now has a

much higher crime rate and real drug problems. Farmers are slowly sorting this out and starting to impose some strategies to protect their business, but they were slow to react and it is taking time for the industry to rid itself of those undesirables.

A second major problem is a phenomenon I call cheque book recruitment. Employers are prepared to pay over a realistic reward for the level of responsibility and skills – sometimes by as much as \$20,000.

Another problem is over-promotion. People are being put into roles they are not ready for, in both the experience and knowledge context. Along with these is mediocrity where employers have accepted below average performance, citing the fear that the next one might be worse.

None of these situations is sustainable and are at best slowly being addressed by the industry. The industry has also had to come to terms with the fact that the best employer may not actually be the best farmer in the context of ability to turn grass into milk. Up until this explosion of conversions, New Zealand had a dairy industry full of very good farmers defined by their ability to turn grass into milk. Today, the best farmers are those who are the best at getting their staff to turn grass into milk. As an industry we have been slow to identify the difference in the skills required.

Immigrant labour

New Zealand has had no choice but to help fill the supply gap with staff from overseas. Farmers are picking up some labour-saving devices, but the reality is it still takes one person for every 200 cows to run a dairy farm. The international staffing market has gone through three distinct phases since 1997 when we brought in our first internationals.

Phase 1

This dates back to the 1980s when most of the people who came to work on farms in New Zealand were from Ireland or England. Their profile was 18 to 22-year-old single males who had just graduated from agricultural college and came to New Zealand for a one or two-year experience before going home to start their career.

Phase 2

In the late 1990s the political unrest in South Africa and Zimbabwe saw a surge of people coming to work on New Zealand dairy farms. Their profile was significantly different. They were anything from 20 to 50 years old, and wanting to immigrate with their family and make New Zealand home.

Many of them were farm owners or managers back at home. They were very experienced but often had little or no formal qualifications, which created some immigration challenges. However, many of these people are now successful dairy farmers here in New Zealand, even if in a previous life they were crocodile or emu farmers.

Phase 3

The most recent phase has been labour from Asia, initially the Philippines, but now includes Indonesia, Sri Lanka and India. This started in the 2005/06 season and their profile is different again. They tend to be 25 to 40-year-old males. They leave their wife and children at home and come here to earn money to send home to improve the life of their family. Around 40 per cent of them decide to stay and bring their families to New Zealand.

Recent reports are that 20 per cent of the employees on Canterbury dairy farms are on work permits, with the Philippines being the main source. The reasons why immigrants are such a high proportion are –

- They arrive to work every day, on time, willing to work
- They are not affected by drugs or alcohol as these do not feature in their lives
- They have a very good attitude, want to please their employer, and are enthusiastic learners.

Each race has its quirks, and a quirk with the people from Asia is they like to save face. As a result they will often say 'yes, I understand' when in fact they do not understand. This does require some management. However that unique trait is easily managed once an employer is aware of it and understands why their employee is acting that way.

The biggest challenge with immigrants is securing their work visa. Immigration New Zealand has variations within their branches to how they interpret the requirements for staff, something Federated Farmers and licensed immigration advisors are battling to resolve.

Summary of the labour market

The labour market today on dairy farms has changed dramatically. It is still less than perfect and history tells me we will never get it totally right, as it takes three to five years for the market to adopt change, and will only start to take it on it when it is virtually forced on them. Employers have

not been proactive in adopting new and different practices. Immigrant labour is just part of the solution.

New Zealand agriculture is well placed to promote a career opportunity for the labour market. There are many opportunities to carve out a career in the industry, and the options today are greater than 10 years ago.

Employers need to be more proactive around employment practices, rather than reactive. If there is no technological breakthrough in the next 10 years, and the scientists tell us there is not going to be, then New Zealand dairy farmers are going to continue to need to staff their farms at or around one person per 200 cows. For that to work, and for it to be sustainable, the industry needs to continue to evolve its employment practices.

What the future might look like

My experience tells me the future picture might look something like this.

- Employers no longer talk the language of one employee per 200 cows, they talk the language of number of man-hours per year to run the farm.
- The employer buys blocks of time. For example, they may buy 2,500 hours from one employee and 1,000 hours from another. The employer keeps buying hours until they have sufficient time, at the right times of year.
- Staff are employed on annualised hours agreements and they record actual hours worked.
- There will be a range of employees who live on the farm and those who drive in.
- There will be a staff facility on the farm where drive-in employees can shower before going home and have their breaks. This is a practice which is more appealing to the employee market as they are more focused on a work and life balance. It does not prevent those who want to work long hours from doing so, and with annualised hours they actually get fairly rewarded for it.

There will continue to be a mix of international and New Zealand staff and we will now employ everyone on a cash basis. By that I mean that the reward employees get will be totally cashed up. If they live in a house on the farm they will pay rent for it, and there will be no non-cash benefits which are not treated accurately regarding fringe benefit tax. This will enable our industry to compare ourselves to others, without fear of feeling the wrath of the taxman. The reality is that non-cash benefits are happening less and less as herds get larger.

John Fegan is Managing Director of Fegan & Co Ltd, a Cambridge-based rural recruitment and human resources firm.



**Aiden Murphy, Alice Sterritt, Jill Greenhalgh
and Rupert Tipples**

Growing labour productivity Agriculture's greatest achievement?



The primary sector in New Zealand accounts for seven per cent of gross domestic product and contributes over 50 per cent of total export earnings. Volatility in commodity prices and the global credit crisis have highlighted the vulnerability of New Zealand's commodity-based agriculture and economy.

Increased competition in domestic and export markets and changing consumer demands for the sustainability of food production practices has led to an increased focus on agricultural productivity. This focus comes as New Zealand's household income remains behind that of Australia and the OECD average, continuing a long-term trend.

However, a number of reports have highlighted how agriculture continues to significantly out-perform the general economy. A Department of Labour report details how real output per worker in the primary sector increased by a third, from \$33,000 in 1988 to \$44,000 in 2002, but employment had increased by only five per cent.

Another recent 2012 report states that: 'Over the past 30 years, the agriculture sector's labour productivity has far outstripped the wider New Zealand economy averaging 4.5 per cent per year, while the measured sectors of the economy averaged only 2.1 per cent'. More detailed agricultural labour productivity estimates from Statistics NZ show 4.1 per cent for 1978 to 2009, 3.3 per cent for 1996 to 2009 and 1.5 per cent for 2006 to 2009. However, is four per cent growth a realistic representation of agricultural labour productivity?

For those of us not career economists some other basic questions arise. What is productivity? How is it calculated? Why is it important and which factors may influence it? This article attempts to shed some light on these questions. Initially we consider productivity, then different forms of productivity, and the role of agricultural services and their contribution to agricultural output and productivity.

What is productivity?

There are a number of ways to describe productivity – from the technical output per worker to working smarter, not harder. Productivity is a measure of the efficiency with which inputs are used to produce outputs. In broad terms, productivity is defined as the ratio of output to one or more of the inputs used in production. Inputs include tangibles such as labour, land, capital and energy, and intangibles include managerial expertise, experience, information and knowledge.

To increase productivity –

- More outputs with proportionally fewer inputs – economies of scale or innovations
- Output levels remain constant and input levels reduce – increased labour efficiencies, improved genetics, improved systems or less wastage
- Decrease outputs but use proportionally less inputs than previously.

What is not productivity

To interpret productivity figures correctly, it is important to remember that productivity is not just about efficiency, it represents other concepts such as technological change and measurement error. It is not a measure of value for money. This is reflected in cost per unit of output. Productivity examines input to output, measuring volume changes with price effects removed.

It is also not a measure of effectiveness. It reflects how much extra output is produced per unit of input, not whether that input has an effective result. It is not the same as production. Productivity growth may occur even when output or production remains the same. Finally, it is not a measure of competitiveness or profitability.

Why productivity is important?

Global competition and increasing consumer demands for sustainable food production have seen increased international and domestic political pressure on improving productivity. Cost efficiencies arising from improved productivity can influence the relative costs and prices of internationally traded goods. At the same time they add credible attributes to food products by improving the use of scarce resources such as fossil fuels and environmentally sensitive assets.

Meanwhile, the importance of improving the nation's productivity lies in the fact that an increase in productivity is one of the major ways in which output and real living standards can be raised, especially in the long run. Productivity information can also –

- Provide an indicator of living standard, assuming that productivity increases are matched by wage increases
- Trace the effect of technological change and assess the economy's underlying productive capacity
- Enable international comparisons of productivity and assessment of policies, programmes, or economic events.

Why measure agricultural labour productivity?

Labour productivity can be crudely defined as outputs divided by hours worked. Therefore, increasing productivity is seen as critical to improving the standard of living. Synlait's chair, John Penno, has noted that New Zealand farmers, especially dairy farmers, have a bad reputation for sacrificing time for money. Moreover, it is often other people's time they sacrifice.

It is no secret that agriculture continues to experience difficulties in attracting and retaining skilled and motivated staff. Currently, farm staff are working extended hours compared with other industry sectors. In a recent survey of 480 dairy farm employees during the calving season from July to October, dairy farm employees generally work 60 to 70 hours a week, 50 to 60 hours during summer and 40 to 50 hours during winter.

A normal person's working week is 35 to 40 hours. Despite the number of cows per full-time employee, which

ranges between 234 in Southland and 158 in Northland, the number of weekly hours worked did not vary significantly with herd size. These figures suggest that in the interests of improved farm productivity, labour productivity is an area worthy of investigation.

Harder or smarter

To enhance the attractiveness of farming careers and stimulate increased employment, New Zealand agriculture needs to improve labour productivity. It must lower weekly working hours to become comparable with other sectors of the economy. To achieve this, agricultural workers will either have to work harder or work smarter to generate continued improvements in agricultural productivity.

The plight of agricultural employers is reflected in the immediate skills shortage list issued by Immigration New Zealand. The increasing dependence of agricultural employers on migrants is a growing area of interest with regard to labour productivity. Longer term visa approvals require applicants to have degrees or agricultural diplomas as well as a certain level of experience. Termed the brain gain, the increased experience, motivation and loyalty of migrants, coupled with formal and practical training, can have positive implications for the quality of staffing.

Labour productivity calculations

Statistics NZ produces three measures of productivity growth –

- Labour productivity growth which reflects the change in the amount of output per hour paid
- Capital productivity growth which shows how a change in the volume of assets such as buildings, machinery, computers, IT and land affect output growth
- Multifactor productivity growth, which refers to the contribution of changing management processes and technology towards output growth. It represents the growth in output which cannot be attributed to either labour or capital input.

Multifactor productivity or total factor productivity can also be described as the portion of output not explained by the amount of physical inputs used in production.

Labour inputs

Labour productivity is the most commonly used productivity measure. This is a measure of the growth in output per hour paid. It is important to note that the hours worked may not be the same as hours paid. The potential for arriving at different productivity estimates immediately arises. Similar to the previous descriptions, labour productivity can be expressed as the ratio of output to labour inputs over a particular time period.

This is particularly relevant for agricultural labour productivity. The hours worked fluctuate depending on seasonal requirements but payment is usually on a salary basis. Using worked hours or paid hours to determine labour input is also an important consideration, as unpaid farming family labour has traditionally been relied on.

Another area of consideration in calculating total labour input for a given amount of agricultural output is the number of different labour sources used. Of particular relevance to New Zealand agricultural labour input figures is the increased use of rural contractors. A steady fall in the number of permanent farm workers has resulted in an increasing range of tasks undertaken by rural contractors.

Agricultural outputs

In labour productivity calculations, output can refer either to the gross output stock-adjusted sales to its nett or value-added output.

- Value-added output is defined as gross output less purchases of intermediate inputs, such as raw materials or energy, which are used up in the production process
- Nett or value-added output is the better measure as it takes into account more of the non-labour and non-capital determinants of output.

It is important to remember that labour productivity is a partial productivity ratio. As such, it can be affected by changes in input proportions such as greater intermediate inputs or the substitution of capital for labour, such as machinery or buildings. Labour productivity can also be affected by the productive efficiency of labour, for example, experience, skills, motivation, innovation, education and so on. The above simplified description of the labour productivity calculation suggests that movements in the average labour productivity statistics may not always represent true changes in the underlying productivity of labour, and need careful interpretation.

Agricultural labour productivity

The first official productivity measures for the New Zealand economy were released in March 2006. Series for the measured sector from 1978 to 2009 were released in 2011. For the productivity measures, output is defined as value-added at constant prices. Statistics NZ note that productivity estimates are presented on an annual basis and across growth cycles, with the latest period 2006 to 2009 not being a complete cycle.

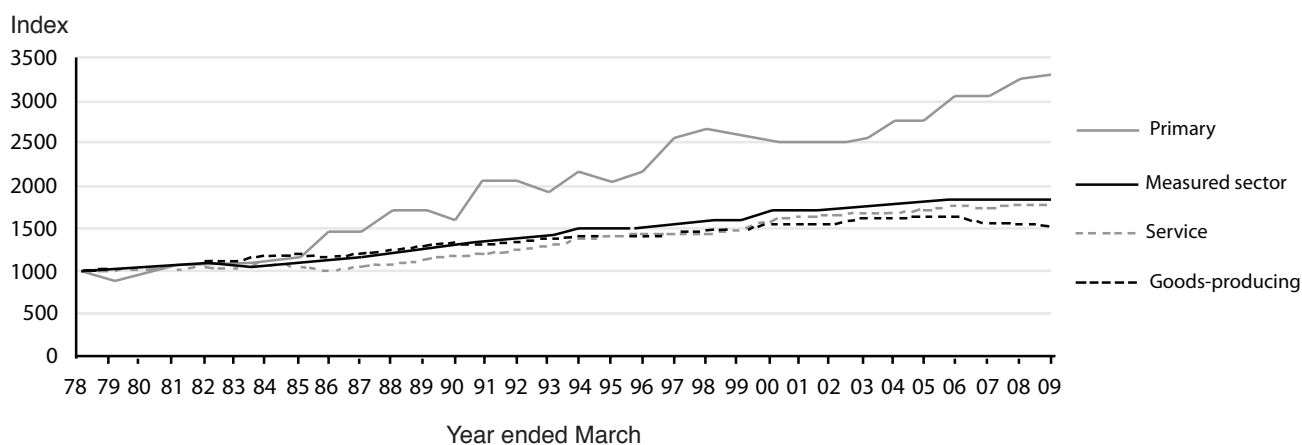
Productivity growth within an incomplete cycle can be biased. However, the long-term labour productivity

Labour productivity by industry

Labour productivity by industry Average annual percentage change Year ended 31 March			
Industry	1978-2009	1996-2009	2006-2009
	Per cent		
Agriculture	4.1	3.3	1.5
Forestry and fishing	3.8	2.8	4.7
Mining	1.7	1.0	-0.2
Manufacturing	1.6	1.2	-1.9
Electricity, gas and water supply	3.6	1.0	-3.1
Construction	0.3	-0.4	-3.3
Wholesale trade	0.5	1.4	-0.1
Retail trade	0.9	2.1	1.2
Accommodation, cafes and restaurants	-1.2	-0.5	-1.4
Transport and storage	3.4	0.8	-0.2
Communication services	9.0	6.6	3.3
Finance and insurance	3.5	5.1	3.8
Property services	...	3.4	4.5
Business services	...	-0.4	-1.2
Cultural and recreational services	...	-2.2	-1.4
Personal and other community services	...	1.7	-2.1
Measured sector	2.0	1.5	0.0

growth rates remained positive, with the highest-performing industries being communication services up 9.0 per cent annually, agriculture up 4.1 per cent annually, and forestry and fishing up 3.8 per cent annually.

The graph illustrates labour productivity growth across the three sectors of the economy. The primary sector consists of agriculture, forestry, fishing and mining which is consistent with national accounts. Labour productivity growth in the primary sector is shown to significantly out-perform the other sectors of the economy.

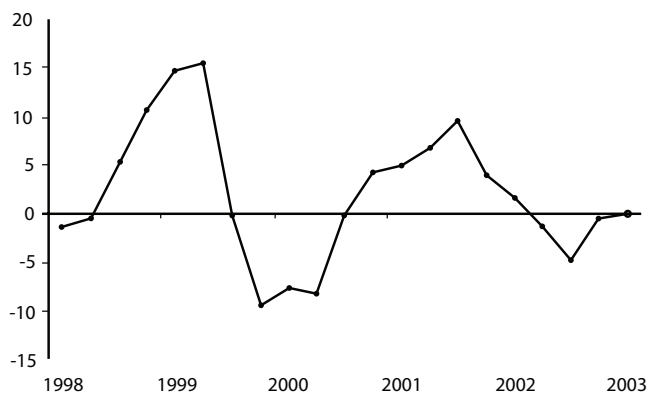


Sector labour productivity indexes year ended March 1978-2009

In simple terms, increased labour productivity results from either an increase in output or a decrease in inputs. Both of these situations have occurred in the agricultural sector. Over the period 1978 to 2005, the primary sector has grown faster than the wider economy, with a particularly strong relative performance from the mid-1980s through until the late 1990s

Another long-term trend has been a steady decrease in the number of permanent farm workers and this is reflected in the graph below. Although quite volatile, the overall primary sector employment growth has trended downwards. The increase in output coupled with the reduction in permanent farm labour inevitably leads to increased labour productivity.

Employment growth annual percentage change



Primary sector employment 1998 to 2003

The combination of rising output and declining labour inputs and the resulting increased in labour productivity are in the next graph. Output volume measure is real gross domestic product at 1995/96 values. As would be expected, there is a negative correlation between productivity and labour input.

The figure of four per cent annual agricultural labour

productivity, which is often reported and just as often used to berate or soothe the agricultural sector, has been shown to involve several different methods of calculation. Researchers have urged caution when interpreting results.

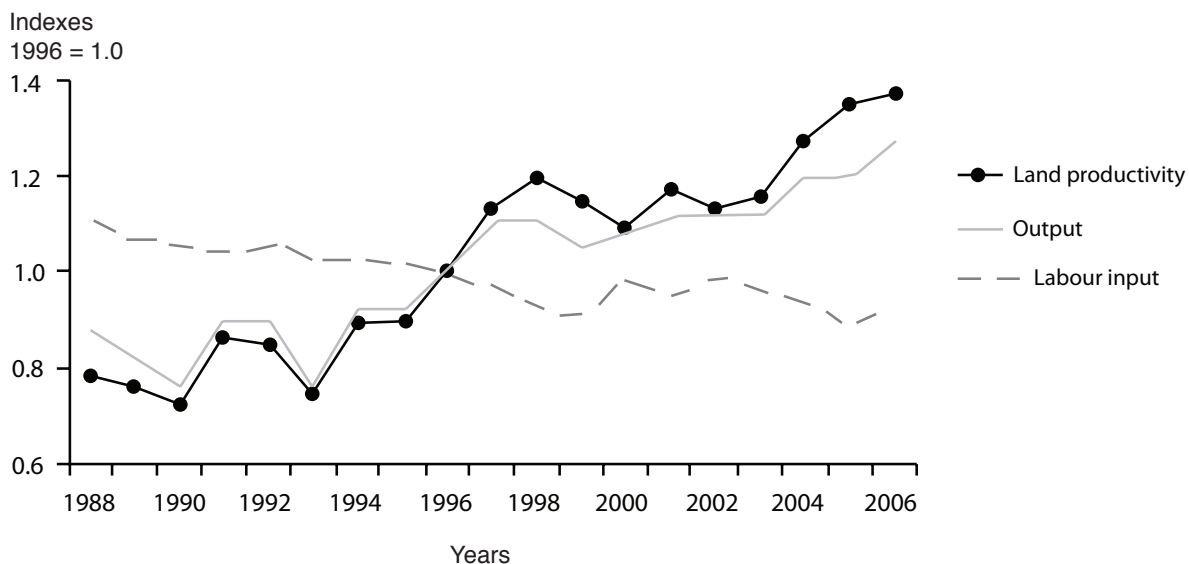
Increasing sector output and decreasing labour inputs have inevitably led to increasing productivity. But can the increase in output really be attributed to a shrinking permanent agricultural workforce? The following section briefly looks at the influence of capital productivity and multi-factor productivity on labour productivity.

Influences on labour productivity

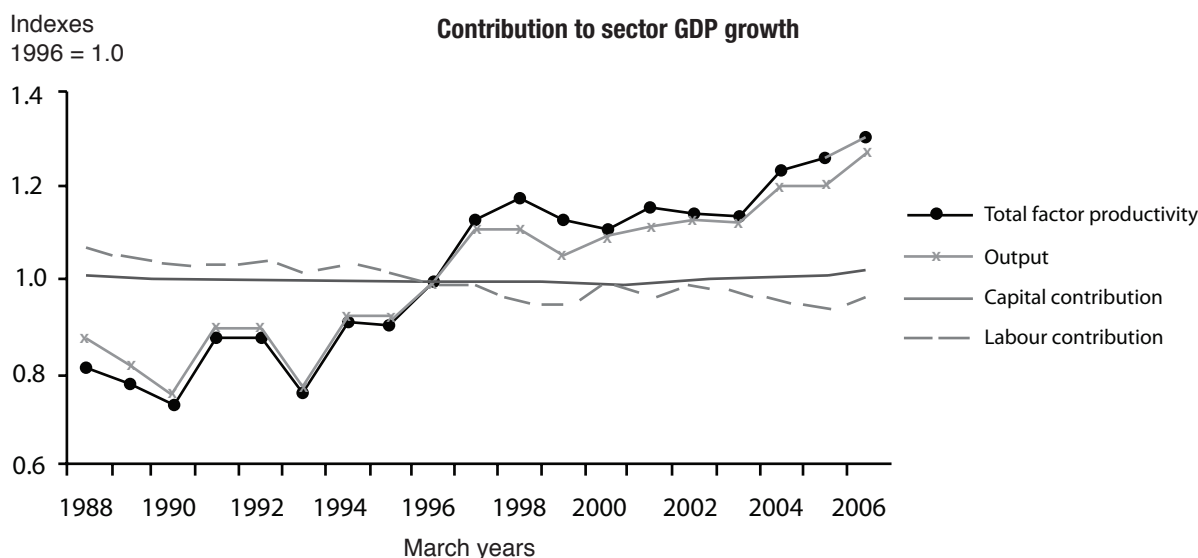
What has caused increased agricultural production and subsequent agricultural labour productivity? Perhaps, due to labour shortages, farmers have been spending on capital. The resulting substitution of capital for labour, in the form of buildings, equipment and labour-reducing automated systems, has contributed to the steady increase in agricultural production. Has it been multi-factor productivity?

The database used for the graph above did not indicate that there had been a significant substitution of capital for labour over the period of 1988 to 2006 as capital inputs flat-lined. The graph on the next page illustrates the level of capital input. It is noted that significant increases in capital expenditure have occurred since 2005, especially in the dairy sector. Debt per kilogram of milksolids has increased from \$6.01 kilogram of milksolids in 1994/1995 to \$21.93 kilogram of milksolids in 2008/2009. Inflated land prices are thought to account for a significant proportion of recent dairy farm debt, although the longer term trend in agricultural capital inputs has held steady.

Also illustrated in the graph are the different contributions to sector gross domestic product growth. Labour and capital have remained steady or decreased while total factor productivity has increased steadily.



Agriculture labour and output indexes



Rural contracting industry

The economic activity in rural contracting is described in a report commissioned by Rural Contractors New Zealand in 2010. The information contained in the report is linked to three slightly different official statistical definitions used relate to gross output, employment and value-added measures.

The table below presents the various industries and the value of services provided by rural contractors. Total services provided in the year to March 2007 amounted to \$2.4 billion with services to the primary sector of \$1.8 billion. In contrast to the agricultural sector, rural contracting employment has grown strongly at an average of 4.4 per cent a year in the five years up to March 2010 and employed 25,900 people at the same date.

Industry use of rural contracting services

Industry	Amount in millions of dollars
Horticulture and fruit growing	367
Livestock and cropping farming	612
Dairy and cattle farming	383
Other farming	79
Services to agriculture, hunting and trapping	360
Forestry and forestry services	6
Meat and dairy manufacturing	134
Residential construction	6
Construction trade services	9
Services to transport	6
Investor in other property	15
Central government	47
Local government	293
Veterinary services	16
Sport and recreation	39
Total uses	2,391

Value-added measures the contribution an industry makes to gross domestic product, representing the increase in value of goods or services generated during production in an industry. The next table provides an estimate of value-added in the rural contracting industry in 2007. The ratio of value-added to gross output for the rural contracting industry is 46 per cent, which is slightly higher than the economy-wide average of 44.8 per cent.

Gross output and value-added in the rural contracting industry 2007

	Millions of dollars
Gross output	2,405
Value-added	1,106
Compensation of employees	619
Consumption of fixed capital	228
Operating surplus	249

Services provided by rural contractors

The lack of information on rural contracting presents a challenge in accurately identifying the role of this industry in amplifying agricultural output. Some of the difficulty in obtaining information regarding rural contractors is because a clear distinction between the contracting sector and agriculture is difficult in practical and statistical terms. In many cases, contractors carry out the same activities as farmers or forest owners and vice versa. In addition rural contractors generally offer additional services which are not directly related to the agricultural sector.

Increased specialisation, professionalism and more mechanisation in agriculture have resulted in a wide range of new production methods and an increased relevance of service providers. Rural contractors not only provide specialised machinery and equipment but also substantial labour input such as dairy relief milkers, calf rearers, fruit pickers, crutching and shearing crews.

List of rural contracting services

Rural contracting services				
Livestock	Crop production/pasture renewal	Forage production	Other	Professional
Ultra-sound scanning	Direct drilling	Mowing only	Fencing	Accountant
Shepherding/lambing	Ploughing	Hay-making	Fertiliser spreading (truck and aerial)	Legal advice
Mustering	Planting/drilling/sowing	Silage	Nutrient monitoring	Veterinary services
Shearing/crutching	Cultivating	Balage	Hedge cutting	Farm consultant
Dipping/spraying	Harvesting		Drainage	Stock agent
Tailing/docking	Spraying	Repairs and maintenance	Soil moisture monitoring	
Drenching	Drying	Welding/fabrication	Roading	
Relief milker	Seed cleaning/dressing	Farm plant and machinery	Land development	
Calf rearer	Storage	Plumbers/pipe layers	Other cartage	
Transport	Cartage	Electricians	Forestry work	
Agistment/grazing			Irrigation	
			Pasture growth monitoring	

The table above, lists a number of rural contracting services readily available in New Zealand. The provision of flexible labour allows farmers use economies of specialisation and to buy in expertise and specialist equipment.

Rural contractors are also thought to be significant for innovation and important for investment, providing new ideas and services to an increasingly sophisticated agricultural and rural sector. Rural contractors add to agricultural total factor productivity in the form of managerial expertise and technology as well as labour productivity.

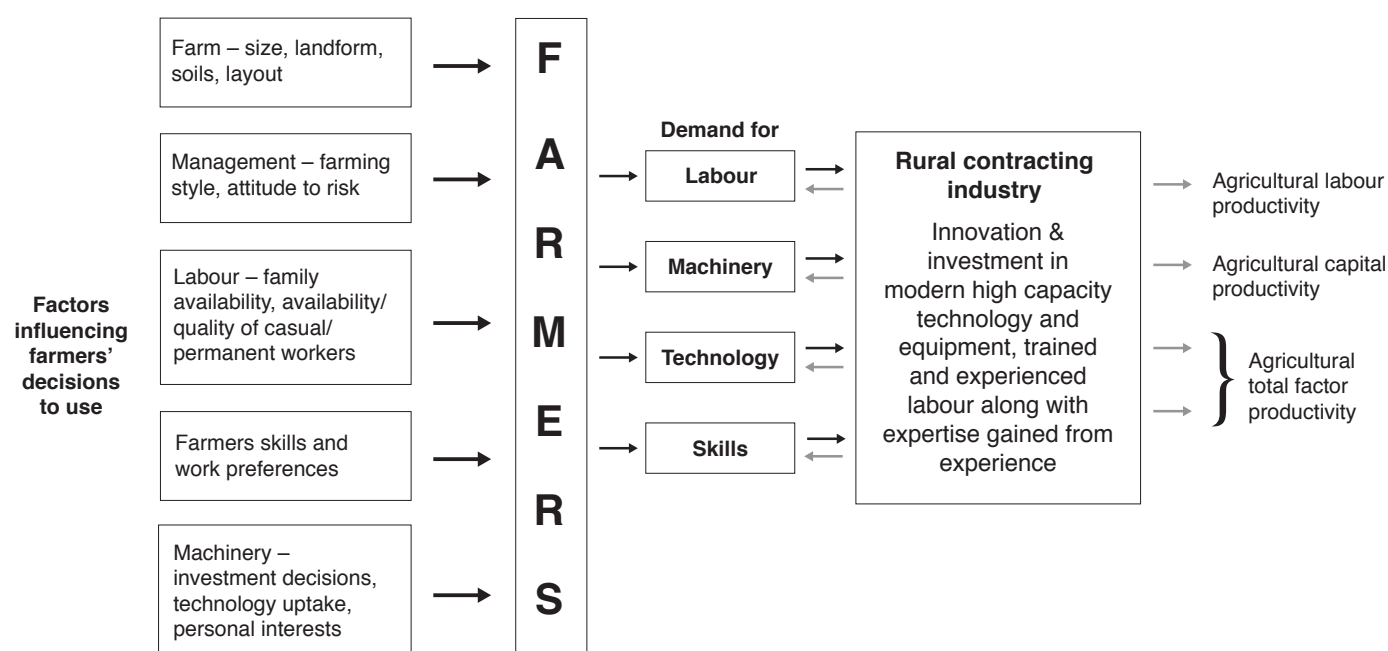
The use of contractors by farmers is seen as one way of passing on the risk involved in investing in expensive and specialised machinery. Rural contractors possess the necessary high capacity capital-intensive machinery, along with employees trained in their use. As contractors generally provide services to different farmers at the same time, the machinery can be used to its full capacity, an essential

requirement for any profitable investment. Agriculture from the mid-1980s has been characterised by the rapid evolution and absorption of new techniques in agri-technology, software and machinery.

Many of these innovations were based on imported technology and this is reflected in agricultural machinery imports, excluding tractors. These initially decreased in the 1980s but subsequently increased rapidly from US\$17 million in 1988 to an average of US\$58 million in 1992 to 2001 and US\$114 million in 2002 to 2006.

Rural contracting at the interface

Capital contribution to output has remained flat and this may be representative of farmers focussing on their core competencies while relying on rural contractors to access modern high-capacity technology and machinery. The diagram below illustrates the role of rural contractors in



Rural contractor interface between farmers and productivity

meeting the demands of an increasingly specialised and technology-driven agricultural sector.

Rural contractors are providing an interface between primary sector producers and primary sector productivity. Lack of evidence restricts researchers to making educated guesses about the influence of the rural contracting industry on agricultural productivity figures. Some research has suggested that 86 per cent of sheep and beef enterprises surveyed had used contractors in the year ending 31 March 2001, compared to only 20 per cent in the dairy sector.

Given the list of services offered, this would appear to considerably under-estimate contractor use. Anecdotal evidence, along with operating cost expenditure of 15 to 45 per cent on contractors by some farmers surveyed, indicates the significant role that they play in agriculture.

Finally, perhaps the most telling indication of the growing influence of rural contractors comes from the Rural Contractors New Zealand survey results. In these, 46 per cent of contractors saw their businesses as growing, with 49 per cent staying the same size, and only five per cent declining in size.

Conclusion

The quality of productivity figures is undermined by the different sources of labour data which may be used in the production process, as well as the difficulty in accurately distinguishing the contributions of capital and total factor productivity. The question remains, what exactly does labour productivity measure?

An additional area of uncertainty regarding agricultural labour productivity is the input of the \$2.4 billion rural contracting industry. The limited information available suggests that rural contractors are important sources of labour and modern machinery for a variety of industries and government organisations. It also suggests that contractors contribute to the agricultural sector via innovation, technical knowledge, capital investment in technology and expertise.

It appears that the performance of New Zealand's agricultural labour productivity has perhaps come at the expense of the rural contractor. Labour productivity has to be interpreted with caution. It is also clear that agriculture

has out-performed the general economy, but unclear as to just who is creating this productivity.

Recommendations

The issue of accuracy in labour productivity figures may be mitigated by at least ensuring consistency in measurement. The reforms of the 1980s sparked the rapid evolution of agriculture in New Zealand, and its innovation and entrepreneurialism has to date not been matched by policy-makers, productivity analysts or statisticians.

As farming businesses continue to adapt, accurate determination of labour inputs is a must. The widespread use of family labour, motivations other than money, and perhaps a lack of awareness from farmers regarding habitual working hours, create difficulty. Greater education about record keeping and especially the recording of labour hours worked per day or per task would add greatly to accumulating an accurate picture of labour inputs.

Mobile technology has a part to play. The creation of an easy-to-use app, or perhaps a motion-activated cumulative time-recording programme, may offer many benefits including an increase in total factor productivity – what gets measured, gets managed.

Measurement accuracy is also a problem for rural contracting. In New Zealand this is a diverse industry which provides a broad spectrum of services to primary producers. The unclear distinction between the rural contracting sector and agriculture, in both practical and statistical terms, creates difficulty in obtaining information.

Changing demands regarding food safety and traceability have started moves towards voluntary registration and audits. Improved information collected by the relevant industry bodies could potentially benefit themselves and policy-makers, and offer researchers access to a wealth of information.

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Diane Ruwhiu

Maori agribusiness

Realising the potential



Two reports in 2011 were commissioned by the then Ministry of Agriculture and Te Puni Kokiri on the Maori economy and agribusiness. On the release of these reports, the Minister for Primary Industries prioritised Maori agribusiness as a significant contributor to New Zealand's primary sectors. The research on which these reports were based found the Maori economy was worth nearly \$37 billion, with total Maori commercial assets within agriculture, forestry and fishing valued at \$10.5 billion.

This accounts for nearly \$1.2 billion of GDP attributable to Maori enterprises in the agriculture, forestry and fishing sectors. A further \$1 billion is attributable to Maori enterprises in the manufacturing sector, including food processing. Since then, we have seen an avalanche of media reporting focused on the growth, sustainability and contribution of Maori agribusiness to the New Zealand economy.

Surprising reaction

An interesting result of this increased attention towards the considerable contribution and potential of Maori agribusiness is surprise. Mention the figures above to the general New Zealand public, and people are usually taken aback at the financial turnover of many of these entities, and the fact many of our Maori-owned businesses have been operating successfully in Maori hands for over two centuries.

For the most part, Maori involvement in the primary industry is a similar experience to other non-Maori business activities. Agribusiness is the interdependent activity between agricultural production and pre-farm gate and post-farm gate business. This represents a system which includes primary production, post-harvest processing, marketing and distribution services, consumption and, more recently, recycling. However, there are some elements of Maori agribusiness which are distinct.

Maori agribusiness is characterised by a wide range of enterprises involving collectively and individually-owned and managed Maori land and water resources for agriculture. The collective nature of Maori tribal businesses is based on customary practices associated with whanau, hapu and iwi modes of production and systems of exchange. A collective presence in business brings with it different practices, accountability and objectives, which are in the case of Maori enterprise drawn from Te Ao Maori, the Maori world. This aim of this article is to give a brief summary of important points around Maori agribusiness.

Success in agribusiness is not new

The economic figures surrounding the Maori economy are impressive, particularly so for a segment of the primary industry which has been somewhat invisible. Sadly, this is mainly due to the polarising, tension-raising rhetoric of some politicking and media reporting around the Treaty of Waitangi and the settlement process. The Treaty will always be a central and vital element of Maori aspirations and development.

However, it is not the one and only reason why Maori have a strong

connection with the primary industry. It is important to debunk the myth that Maori agribusiness is funded and driven by Treaty money. Recently, Maori Affairs Minister Dr Pita Sharples recognised that Maori collectively-owned farming businesses are some of New Zealand's oldest existing businesses. Even 'before the Treaty of Waitangi was signed Maori entrepreneurs were leading New Zealand's first overseas trade missions, they were helping to establish our sheep industry and exporting produce direct to Australia on their own ships.'

Commercial activity in New Zealand during the frontier era of 1792 to 1840 highlighted distinct entrepreneurial activities that had relevance for the nation's immediate and long-term future. These endeavours included the development of significant agricultural ventures and shipping fleets, along with flour-milling and saw-milling to supply the growing population of a domestic market.

During this time, Maori agricultural and forestry goods found international markets, as Maori travelled overseas and became involved directly in international trade to the Pacific Islands, Australia, North and South America, Asia and Europe. They also brought back innovations such as wheat cultivation and commercial dairy farming, which were first established in New Zealand by northern chiefs. It can therefore be said that primary industry activity has been a central feature of Maori economic development, and a major player in the New Zealand economy.

Maori agribusiness is Maori

Often, in discussion about Maori business, you will hear the term *kaupapa* Maori described as the Maori way, reflecting ways of doing, being and thinking. This is informed by the collective and inter-generational wisdom of Te Ao Maori, the Maori world. In their migration and settlement Maori maintained and developed further specific cultural myths, norms, protocols, cultural traditions, kinship systems, economics, politics and social processes that shaped the organisation of Maori lives.

Kaupapa Maori is therefore both a set of philosophical beliefs and *tikanga*, and a set of social practices founded on a series of deeply embedded Maori values. These include –

- Whanaungatanga – collective interdependence between and among people
- Manaakitanga – nurturing relationships, looking after people and being very careful about how others are treated
- Kaitiakitanga – ethics of conservation and stewardship of our natural resources.

These principles are behind the practices which remain cultural features of social life in Maori communities and organisations.

In today's global economy there is considerable pressure to capitalise on the rich diversity of New Zealand's land-based resources. For Maori, that pressure has to be balanced with the broader sets of responsibility embodied within Te Ao Maori. This places different values and processes on the natural environment and its use as a resource to be nurtured or exploited.

Maori values

Doing business in ways which incorporate Maori values into everyday business activities features heavily in some of our well-known iwi enterprises. Cultural values are a unique feature of the Maori economy. It is widely recognised that there are distinct advantages from socially complex assets such as tradition, culture and knowledge which contribute to the social, environmental and economic wellbeing of Maori communities, as well as the whole economy. These operations are evidence that sustainable economic development, accommodating both Maori values and commercial endeavours, locally and globally, is possible and advantageous.

The inter-generational focus of iwi and Maori collective organisations results in strategic aims which encompass multiple results. The importance of familial lines, succession and preservation of the landscape for children is not unique to Maori. There is recognition of how these values influence decisions made with regard to resource use or reinvestment strategies around land assets.

Maori involvement is diverse

The depth and diversity of Maori agribusiness throughout the primary industry is evident. This is a testament to the tenacity of Maori landowners who managed through the difficult times of land alienation to today. Now they offer a brighter, stronger future, and are considered essential players in the future development of the primary industry in New Zealand. The big three are in agriculture, forestry and fishing, where there is a multitude of collective enterprises operating.

In dairy farming, there are major organisations such as Parininihi ki Waitotara Farms Ltd of the Taranaki area who are a significant supplier to Fonterra. Miraka, a Maori-owned milk powder processing facility in the central North Island plateau, have invested beyond the farm gate and extended their strategic control into processing and marketing milk products. Atihau-Whanganui Incorporation manages a diverse portfolio of dairy, beef and forestry enterprises across 41,700 hectares of lands and assets worth close to \$200 million.

In the South Island, Wakatu Incorporated has successful business portfolios in horticulture, viticulture and fisheries, with very successful brands such as Tohu wines. Kono is a premium New Zealand food and beverage company owned by Wakatu.

There are also the many business activities of Ngai Tahu Holdings Group, most well known for their involvement in tourism, seafood and forestry. More recently, they have invested significantly in dairy farming. Te Runanga o Ngai Tahu is also a research partner with the Agribusiness Group, Otago University and Lincoln University. Together these groups form Agriculture Research Group on Sustainability.

Maori fisheries trust

Within the fisheries sector, Te Ohu Kai Moana, the Maori fisheries trust, was established to advance the interests of iwi

individually and collectively, mainly in the development of fisheries, and fisheries-related activities. The trust represents the largest Maori-owned seafood company in New Zealand. Maori involvement in New Zealand fisheries has enabled them to develop institutions to manage their resources more intently, with a strategic stake in the capture, processing and exportation of commercial seafood.

Although most Maori business interests in the primary industry are collective, there is also a number of small and medium sized Maori owned business activities. These business operations are more entrepreneurial in nature. For example, successful entrepreneur Hayden Pohio, has combined food technology with natural New Zealand manuka honey to create Boosta Bars. These are sold throughout New Zealand and exported to Australia, the United States and Japan.

We would also include small Maori businesses run by independent operators on family-owned lands. Kaiwhenua Organics is one such example, run by Kaiwaka Riki and Lynette Lovini as an organic market garden on land belonging to Kaiwaka's family in Raglan. They have a simple philosophy, good quality, organic seasonal vegetables sold to the local market and grown using traditional Maori market garden practices.

Productive capacity

There are large areas of Maori land which are considered marginal, unproductive or under-performing. Maori agribusinesses are aware of the need to make improvements in their production processes. Government policy has also recognised the importance of increasing productive capacity of Maori land assets. There are very specific policy and funding models emerging from government agencies which emphasise science and innovation to do the same things better, or more innovatively.

The productive capacity or unrealised potential of Maori land assets is of real concern, not only for Maori, but the New Zealand economy in general. Productivity improvements in Maori agribusinesses could occur at a variety of managerial, processual and technological levels in many agriculture, horticulture and forestry operations. Understanding and investing in science and innovation will improve opportunities for a variety of stakeholders in the Maori economy.

Cultural value

It is essential to recognise that often unproductive assets in economic terms have very real value. These are places of deep spiritual, cultural, and historical significance to specific whanau, hapu or iwi due to association with tribal ancestors, burial grounds, special places associated with birth or death of chiefly persons, or traditional canoe building and landing places.

Temporary tapu may be placed on hunting or fishing grounds or cultivations to conserve and protect their resources. Wahi tapu may also include places associated with particular tupuna and events connected with them. The significance and the tapu of these sites remain. This

perspective is not unique to Maori. We have seen significant community resistance to mining in the Coromandel and the current problems arising over the destruction of heritage buildings in the Christchurch rebuild.

New models of collaboration

Collaboration and strategic partnering, public and privately, has opened up many opportunities for Maori agribusiness. An example is the recent launch of Hikohiko Te Uira Maori, a Maori enterprise internship programme designed to grow the science and innovation capability of Maori businesses.

It is a joint venture between Crown Research Institute Industrial Research, the University of Otago and the Federation of Maori Authorities. There are three Otago undergraduate and postgraduate Maori students starting the programme this month in Wellington, working with the science and commercialisation teams before heading out to the member trusts and incorporations.

In addition, Maori agribusinesses can also be viewed as sources of innovation. As an example, a new initiative by Whakatane-based Ngati Awa in the Bay of Plenty aims to secure the future of the eel industry by bringing commercial and customary fishers together for the first time, establishing a National Eel Association. This is partly to secure the nation's dwindling wild eel populations, but also to work together to grow New Zealand's exports of eel and the global market.

The value chain

Another point is that organisations wanting to compete on a global platform require strategies which can help managing resources and market requirements in geographically, socially and environmentally diverse locations. The global market for agricultural products has many opportunities, but it also has significant challenges for all of our producers. It is inevitable that scrutiny of our production processes, supply chains and technologies, associated with assuring the quality of our produce, are only going to become more stringent.

Food security, the ability to track produce, as well as accountability to problems such as animal welfare, social and environmental responsibility and overwhelming concern with climate change are going to become more important to our markets. Real or imagined, these are influencing consumer behaviour, political policy and industry expectations.

Much of the focus is on targeting premium markets by developing innovative and high-value export chains of differentiated products. In combination with the anticipated world demand for exports from New Zealand growing across a range of industries, there is significant opportunity for Maori agribusinesses to take advantage of the goods produced.

International trade

In the last few years there have been several Maori-focused international trade delegations, mainly to the Chinese market. There has been a great deal of attention to cultural

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John Janssen

Maori agribusiness

A growth story



In the past few years, the contribution and potential of the agribusiness sector to New Zealand's long-term wealth is receiving greater attention. As the global financial crisis rained wealth destruction down on most sectors of the global economy, the fact that people still need to eat made the traditional farm investment look a lot smarter than the twilight industry reputation it had been given just a decade earlier. Within this sector there is a sub-segment of businesses growing and performing strongly under the radar – Maori agribusiness.

Maori and iwi-owned agribusinesses have grown to consist of around 10 per cent of New Zealand's agribusiness sector. In the March 2011 MPI study, 'Maori agribusiness in New Zealand – A study of the Maori freehold land resource', the Maori land resource is estimated at 1.5 million hectares. Of this, approximately 19 per cent is land class IV or better – can be cropped, with another 34 per cent class VI – pastoral, and 31 per cent class VII – extensive grazing and forestry. The report also states that Maori agribusiness contributes between eight and 10 per cent of milk solid production and 10 to 15 per cent of sheep and beef stock units to the agribusiness sector.

These findings make two things abundantly clear. These enterprises make a significant contribution to New Zealand's agricultural production, and they will probably play a large part in the growth and development of the sector.

Land-holding aspects

Mature, well-resourced Maori agribusinesses share many similarities with the rest of the sector. However, they have a number of unique features making them more likely to succeed in the current operating environment when compared to non-Maori businesses. First, some or all of the land-holding is generally held in Maori freehold title. Secondly, instead of a single individual or a small number of shareholders owning the land, it is usually subject to a more collective ownership of hundreds or even thousands of individuals.

The relationship of the owners to the land is a unique and important one and can lead to a number of challenges for enterprises looking to intensify, amalgamate or expand holdings. However, when these challenges are overcome, the enterprises which develop are often more effective than non-Maori enterprises of similar scale. This is not surprising given that the same set of requirements to satisfy owners for the land and business to be run well are the same as those required to satisfy capital providers, staff and other stakeholders. That is, a high level of governance, a clear strategic plan, and an effective business planning and monitoring framework.

The challenges of less well-developed enterprises are a little more pressing. Lack of scale is an important problem. No matter how good a piece of land is, if it is too small to be economic, it will always be a struggle. Initiatives around amalgamation of land can help and bodies such as the Maori trustee are in a good position to help where owners wish to advance this type of agenda.

Financial concerns

Access to capital is an important problem for smaller enterprises and is usually attributed to the challenges with financiers taking security over Maori title. Problems around the power of principals, such as trustees and directors, to pledge security on behalf of agents ensures that the status and enforceability of rights as mortgage holders are a prime concern to financiers when considering lending to Maori land. This excludes the reputational risks surrounding enforced sale of Maori land.

This is not to say that there is no tangible security available. Livestock, dairy company shares and equipment can all be lent to and secured separately. However, what is often required for growth is capital for development expenditure to intensify land to improve productivity. This is where businesses without a recent track record and a clear secondary exit can have problems raising capital. The primary exit is the cash flow generated in the normal course of business.

Alternatives

There are other alternatives to taking a mortgage over the land itself which can still unlock some security value for financiers to lend against. For example, granting a long-term lease can create a cash flow which is effectively a financial asset. This sort of arrangement is likely to be preferable in any sort of situation where a financier acts on a default.

However, the lack of a clean sale is a significant challenge faced by Maori agribusiness and means that much more attention is paid to the ability of the enterprise to amortise debt and run a sustainable model. This often results in gearing levels lower than those usually seen in non-Maori agribusiness, aligned with the strategy of the Maori enterprise. This needs surplus cash flow to enable payments to shareholders, kaumatua grants and other cultural, social or environmental projects, as well as the generation of capital for future investments.

Governance

Poor governance is often pointed to as the reason for lack of support, but this is rarely the case on its own. Effective and credible governance using experienced advisors is, from a financier's perspective, vital to gain comfort when making development funding available. Governance structures in some enterprises date back 50 or 60 years and operate at a level above most non-Maori businesses of similar scale. However, these structures could, in some circumstances, benefit from the input of one or more independent directors or trustees to the process.

A catch-22 can develop, where in order to access development funding for land which cannot be easily used as security, banks like to see a track record of performance. However, without the development expenditure it is difficult for a growing enterprise to prove this. Enterprises can successfully solve this problem by using external expertise, in conjunction with skilled management staff, to carry out

development plans. Usually this will take the form of a well respected local consultant, accountant and then a manager or share-milker with a track record of success.

Positive features

In a world demanding safe, branded, high-quality food Maori agribusiness is an obvious focal point for value chain integration. Scale and unique brands allow this, as well as the long-term focus on non-capital returns present in the Maori agri-business model. What initially appears to be commercial negatives around lack of liquidity of land assets can, in fact, be seen as a being positive.

Well-governed Maori land owners and operators are almost entirely focused on generating returns from profit rather than by capital appreciation, due to the desire of the shareholders and management to retain core tribal lands. This inevitably will continue to lead to a focus on profitability over productivity, and innovation around gaining value from all available resources.

Success factors

With the current focus and growth in exports to Asia, Maori agribusiness is well placed to take advantage of significant export opportunities. Individually, and as a collective, Maori agribusinesses share critical success factors with the fast-growth Asian economies including –

- A strong cultural brand with deep historical roots in the land
- A collective approach to land ownership
- Individual and collective scale and capacity to invest in downstream processing, marketing and export
- Long-term horizons with strategic plans, sometimes in excess of 50 years.

Maori agribusinesses appear to have taken a cautious approach to the Asian opportunity, typical of a group with a long-term business strategy. Any moves are likely to be well considered with risks mitigated as much as possible.

Taking the lead

The agribusiness sector in New Zealand continues to underpin the economy. With growing recognition of this fact we see the increasing scrutiny of the public asking questions about the sustainability of the industry, the logic of producing ever more amounts of base commodities and the ability of the industry to withstand overseas competition and subsidisation.

Maori agribusinesses, which have been considering and balancing these concerns over a period of decades, are now taking the lead in facing the challenges of today's agribusinesses. As such, this sector has developed best practice which is applicable to all agribusiness.

- Use of expert advisors, usually trustees or directors of Maori agribusinesses, who are adept at commissioning, considering and acting on the advice of experts
- Succession plans in place for directors, trustees and staff. Non-Maori agribusinesses usually have important individuals in the business, normally the founders. In

contrast, Maori enterprises often display a depth of leadership complemented by external advice. Many of the governance structures have undergone a full cycle of renewal.

- Focus on profit and loss over the balance sheet. A lack of desire or ability to realise capital gains on core land-holdings results in an increased focus on the generation of trading profit to enable wealth creation.
- Long-term planning in evidence.
- Understanding of the needs of all stakeholders in the enterprise, not just owners.

With a growing significance in a sector which continues to contribute significantly to New Zealand's economy, Maori agribusinesses are well placed to achieve more growth in today's business and export environment. Smaller businesses face some challenges, but they are not insurmountable. For larger enterprises, the opportunities are significant. With unique branding and farming practices perfectly suited to today's environment, Maori agribusiness is set to become a significant and formidable player in the agri-sector.

John Janssen is National Manager Agribusiness at the Bank of New Zealand.

Ahuwhenua Trophy BNZ Maori Excellence in Farming Awards

For more established enterprises the future is very bright. The pinnacle of recognition within Maori agribusiness is the Ahuwhenua Trophy – BNZ Maori Excellence in Farming Awards which recognise and celebrates the highest achievers in the country. Winners of the Ahuwhenua Award display industry leading capability in governance, Nga Tikanga Maori, financial management, production and environmental categories. The award has grown in stature over the past 10 years and mirrors the increasing recognition of Maori agribusiness and the Maori economy in general.

The 2012 dairy competition was an example of the diversity of Maori farming. The finalists ranged from the 92 hectare Wharepi Whanau Trust with 60 shareholders, to the eventual winners Kapenga M Trust with over 1,800 hectares of land and 915 shareholders.

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resonance as a potential market opportunity, of which there are two threads to consider. The first is embedded in the basic conception of a brand. The idea of Maori Inc – as a partner to NZ Inc – is the recognition of indigenous Maori produce as a unique high quality and therefore a high value brand.

The second is less tangible as it recognises the value inherent in a Maori way of doing business drawing from the cultural values which embody Te Ao Maori. This is not just a case of Maori being friendly. It is giving authority to the deeper sets of relations and practices associated with Maori values such as those outlined above. This level of understanding provides significant advantage and stems from increased attention of a more globalised and diverse world.

In countries such as China, who share similar cultural values, when combined with processes that assure quality and food security, culture can be used as a brand-specific component. China is widely recognised as a major trading partner, but for the most part what is exported is low value primary products, such as logs or milk, where the value is added in that country.

Significant potential

That in itself is still reflects significant returns and opportunities for the primary sector. However, Maori products traded through supply chain networks which are based on common cultural understandings, have the potential to generate added value at the New Zealand end of the supply chain.

My aim in this article was not to sell the idea of Maori agribusiness. The future for Maori agribusiness is vast and full of opportunities. But I do not necessarily base that on the media or government reporting. I think Maori agribusiness has significant potential which, if realised, will further contribute to the landscape of the primary industry in New Zealand. I also think that non-Maori agribusinesses have potential which, if realised, will further contribute to the landscape of the primary industry in New Zealand.

Without doubt the primary industry will continue to be a vital cog in the machinery driving this nation's future growth and development. Maori are not the only important players, but they are players in the game.

What I do believe in is that Maori need to reflect on and celebrate indigenous distinctiveness and all that it means to our business activities in the primary industry. I have been privileged to have spoken to some committed and knowledgeable people, both Maori and non-Maori, working in Maori agribusinesses. Something I have learned is that there a deep sense of pride in what has been achieved and recognition of the strategic value of a strong Maori identity in business. Maori agribusiness has, and will continue to, expand its horizons. It may not be new, but we can realise the potential.

Diane Ruwhiu (Ngapuhi) is a lecturer in the Department of Management at the Otago Business School, University of Otago.

Jim Webster

Animal welfare in New Zealand pastoral industries A growing need to do it well



New Zealand is very good at growing food, currently producing sufficient to feed around 20 million people. We are clearly unable to eat all this food ourselves so most is exported and is supporting the backbone of our economy. Much of the food we produce is animal-derived, due to our core ability to grow ryegrass and clover-based pastures and then use ruminants to convert pasture into valuable protein sources such as milk or meat.

However, the potential of New Zealand pastoral industries to increase economic returns by production gains alone is finite due to land availability, and environmental and social pressures. Obtaining higher prices for our food will therefore become increasingly important as a means to increase returns. This requires producing food with specific attributes that can be marketed at a higher value.

All the properties sought after by consumers need to be met if we are to satisfy expectations and become recognised for quality and established as a preferred supplier – pre-requisites for achieving a higher price. Animal welfare is a valued attribute by consumers, and retailers are placing our pastoral production practices under increasing scrutiny to meet their marketing needs.

Producers must meet more stringent standards and certification requirements to supply these high-value markets. In addition, electronic communication and easy access means all of our production practices are made very visible to the outside world. While we may target growth into sectors we regard as having lower animal welfare expectations, we cannot adopt lower standards of production for these markets at the risk of damaging all our exports. We therefore need to ensure our animal welfare practices are right in the eyes of everyone here and overseas, as discrepancies could potentially be costly.

Rise of ethical consumerism

Taste and other traditional sensory characteristics, such as colour for meat, are not the only aspects of food which influence consumer purchasing decisions. The way that food is produced is becoming more and more important.

Valued ethical production traits include food safety, environmental sustainability and animal welfare. This country's standards across all of these can have a collective influence on the economy, and this link has been noted and referred to as New Zealand Inc.

Several studies have demonstrated a willingness by consumers internationally to pay a premium for animal welfare-related attributes. Recent research, for example, by Olynk and Ortega demonstrated that such a premium was placed on verified pasture access for specific dairy products in the United States. There is increasing interest in labelling animal products according to their animal welfare status, as it allows consumers to express their preferences for different levels of welfare.

Studies in the United Kingdom found there was consumer support for a tiered labelling scheme for meat. Animal welfare, as a sought after ethical

attribute of production, is tied into the perceived quality of New Zealand products. It therefore has an important role in supporting and protecting our external markets and economic success.

Animal welfare expectations and requirements

Animal welfare, despite being about animals, is a human concept and it refers to the expectations we have about the quality of life experienced by the animals in our care. The animals' experience is central to this concept, as their welfare is a characteristic of the individual animal itself and not something that can be given to it directly.

Provision of resources, such as space, food, shelter and supervision are essential to the standard of welfare, but they do not determine the level of welfare alone. As welfare is a human concept, we each have our own perspective of what it should be or look like. These perspectives have been grouped into three dimensions based on the emphasis people place on different domains of an animal's experience – health and biological functioning, affective or emotional state and natural living.

These dimensions provide an important guide to where we must place emphasis on the lives of our animals and on the minimum standards that must be met when producing animal products. The consensus of society expectations around welfare is reflected in our need to meet each of these welfare dimensions in ways that satisfy the sectors of society to which it is significant. The national expectations are given legal status via the Animal Welfare Act 1999 and Codes of Welfare.

A good record

New Zealand has a good record in animal welfare law, with the Animal Welfare Act at the forefront of global legislation in this area when it was created. Importantly, there is a comprehensive framework of advisory panels, committees, and educational and research bodies that support this legislation. In New Zealand, this structure is characterised by close communication and collaboration between the various stakeholders, providing a very inclusive and unified basis for progress.

This legislation has been an important benchmark over the succeeding years to demonstrate our commitment to high animal welfare standards in our markets. The Animal Welfare Act is currently under review, and the next version of this legislation must maintain our national and international high standing in this area.

Codes of Welfare

The Codes of Welfare encompass our expectations of animal welfare in specific production systems and circumstances, and also guide producers and operators about how to meet them by providing examples. Codes of Welfare are important in defining the baseline and best practice of how our pastoral industries operate. They also provide an external measure to consumers in our markets of the importance of welfare in our production systems and a guide to whether it meets their expectations.

An animal's experience has an important influence on its level of welfare and this is reflected in welfare standards which place an emphasis on results for the animals themselves. This focus on results is the predominant approach adopted in New Zealand Codes of Welfare. Results relate directly to the experience of the animal, and because they are not overly prescriptive they provide flexibility for producers in how they can be achieved. This flexibility is important in pastoral farming systems, which are very variable.

However, results are more difficult to measure than discrete resource standards such as space, food and light. Even more challenging is how do we know what an animal is experiencing and how it feels about the world? Answering questions like these is a current focus for animal welfare science, and an important challenge to meet in order to assure the public that our animal welfare expectations are being met.

Animal welfare science contribution

Historically, there has been a great deal of focus in animal welfare science on health and functioning. Affective states were considered where these were mainly related to negative states, such as pain, hunger and thirst. Alleviating the negative aspects of these dimensions often carry production benefits, important in determining industry uptake.

However, there is a more recent move in welfare science into measurement of positive affective and emotional states which carry considerable challenges for researchers. This is not only in terms of the basic understanding of these states in animals, but also in how to measure them. Advances in our understanding of how emotions are generated in animals, and their central effects on behaviour and well-being, are likely to lead to increased inclusion of affective states in animal welfare codes.

There is growing international attention on the measurement of positive emotional states as improvement to alleviate negative events from animal's lives. This is an area that New Zealand could benefit from if positive affective states associated with pastoral systems can be demonstrated.



Natural behaviour

Naturalness as a characteristic of good welfare also has difficulties in how to measure it and in terms of how far this concept can be applied in production systems, such as the trade-off between naturalness and requirements for supervision and care. For example, extensive pastoral production systems may allow good opportunities for natural behaviour and therefore rate highly in the naturalness domain. However an associated low level of supervision and care, which could contribute to high lamb mortality or health issues such as fly-strike, could be regarded as negative in our markets.

Similarly in the dairy industry, pasture grazing is seen as positive in terms of naturalness. But it carries difficulties in managing body condition due to a variable and often unpredictable pasture growth pattern, and environmental stress if adequate shade or shelter is not available.

It could be predicted that New Zealand pastoral production systems are positioned well to meet both affective state and naturalness dimensions, but there is a still growing need to understand and manage potential areas of animal welfare concern. Animal welfare researchers at AgResearch are currently trying to understand the effect on animal affective states of a number of situations, such as those mentioned above, which are associated with pastoral systems of production.

One way to find out how animals feel about their environment and situations is to give them a choice between different options, and measure which one is preferred in a range of conditions. Other ways to determine how animals perceive different situations is to objectively measure their behavioural responses, such as the frequency of specific behaviours or the time spent in different activities. We usually apply behavioural methods such as these, in combination with sophisticated physiological monitoring to more fully interpret and quantify animal perceptions.

Different solutions

This multi-dimensional approach allows us to answer questions about the effect on animal welfare of different management practices within our pastoral industries. Recent examples of these questions from the dairy industry include preference and effectiveness of cattle for different ways of cooling at the dairy shed and the comfort levels of different off-pasture substrates such as concrete or rubber mats.

The research has also highlighted that new methods will be needed in pastoral production systems to compensate for decreasing individual animal contact as herd sizes increase and labour is reduced. They are also required for monitoring

and assurance of welfare in extensive environments.

Solutions involving non-invasive and automated monitoring using infrared measurements are also being investigated. Another current welfare problem, which will continue to put pressure on existing management practices, is the need to improve pain relief for husbandry practices such as disbudding, and a potential end to many painful procedures. While research has shown that analgesic drugs can be very effective, their use on farms is currently low because of the expertise and costs involved.

Development of more farmer-friendly solutions is under way to help with the pain of these procedures and improving their acceptability until other solutions are found. An important role of the research is to help producers stay ahead of moving public expectations on animal welfare.

Retailers have a major influence

Society's views on animal welfare are continually changing in the direction of higher standards and expectations around the care of animals. This move is supported by our increased understanding about animal capacity for suffering, and is kept in the public eye by media, retailers and animal advocacy groups. The pace of this change can be quite rapid in comparison to legislative movements, which are incremental.

This can lead to a discrepancy between expectations and production practices. Retailers, in particular, have occupied this gap and contributed to the rapid increase in the number of private animal welfare standards and schemes to meet their customer expectations. As animal welfare forms part of purchasing based on ethical production, it is an important area in which retailers can differentiate and demonstrate their ethical status.

Retailers are in a unique position in the supply chain, from the point that a consumer makes a purchase back to the farm where an animal was raised. Using private standards, they are having an increasing influence on the way that the animals are produced globally.

International standards

New Zealand producers must meet standards set by international retailers, such as Waitrose in the United Kingdom and Whole Foods Market in the United States, if they are to do business with these companies. The latter retailer, for example, puts a great deal of emphasis on developing and building a reputation as a trusted proxy for their customers. They ensure high quality products to achieve consumer loyalty and higher prices. In most cases, therefore, the welfare requirements of these companies are higher than the minimum standards prescribed in New Zealand legislation.

This end-to-end influence by retailers brings this country's producers squarely into the food production space and also puts them in a valuable position as far as their influence on the ethical reputation of New Zealand by consumers. It also carries a challenge for producers to

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Nick Ledgard

Braided rivers – something special



What is treated as commonplace in some countries can be a treasured item in others, such as pine cones. We see them everywhere in this country and consequently hardly take any notice of them. However, that is not the case overseas where all sorts of birds, animals, invertebrates and fungi do not allow them to reach maturity. They are so treasured by some nationalities – as decorations akin to dried flowers – that I was able to start up quite a flourishing little pine cone exporting sideline.

This disparity in national interests is also the case with braided rivers, which are just another river to most New Zealanders. Until recently they were looked upon as a source of basic resources that were there for the taking, to be mined for recreational pursuits, and commodities such as water and shingle.

I am informed that 7,500 truckloads of shingle are extracted annually from just the Waimakariri and Ashley rivers. It is only very recently that we have started to realise that braided rivers are indeed something special on the global scene, with attributes which are relatively unique and definitely in need of conservation.

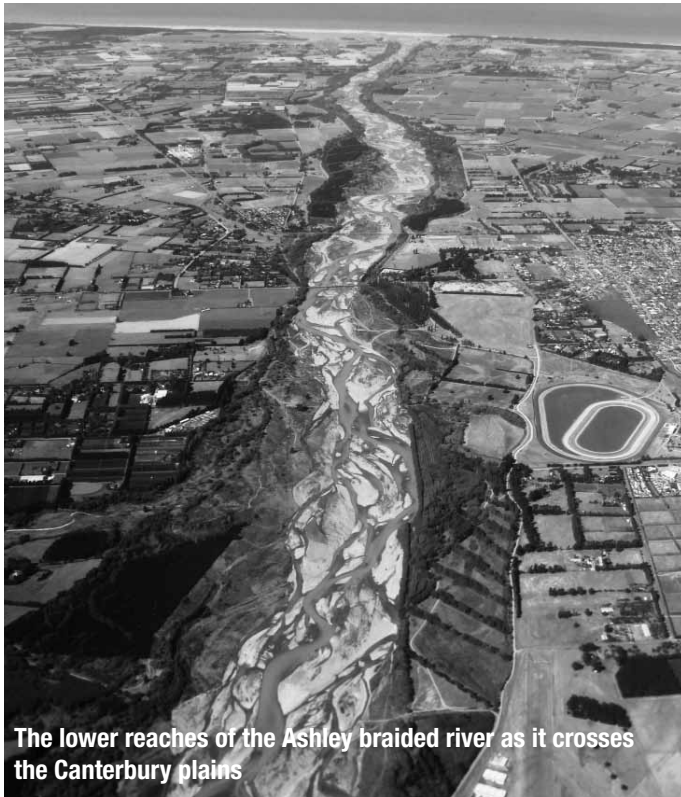
Creating braided rivers

To create a braided river a country needs tall unstable mountains, a high rainfall and long gradual slopes reaching out to the coast. We have these in New Zealand, particularly in the South Island, where the Canterbury plains were formed from the outwashes of braided rivers. Many of us down here live on land created by braided rivers, which is probably a major reason why we take them for granted. We have 163 braided rivers in this country, covering 248,000 hectares. The South Island has 92 per cent of the national area, with 60 per cent in Canterbury.

In the early days, no topographic feature commanded more respect from the land traveller than a braided river. Lives were frequently lost when trying to cross them, contributing significantly to what was then known as ‘the New Zealand death’ – drowning. Even today, the bridges that cross them still determine the direction of main roads. So strategic are these rivers that one would only need to destroy a handful of bridges to effectively divide the South Island into separate parts.

If there is one word that best defines braided rivers it is dynamic – they are forever changing. Anyone frequently crossing our long Canterbury bridges would be familiar with multiple braids of clear water which can change overnight into brown torrents stretching from one bank to the other. A characteristic of these floods is that they are often of very short duration, lasting just a few hours – a needle-like spike in the gradual rise and fall of the hydrograph.

For those with an interest in water use, particularly for irrigation, the challenge today is to harvest those peaks of water flow for storage and later use on adjacent flat intensively managed plains. These can often be in the grip of drought at the same time as floods are racing down river. However, the natural purpose of such floods should never be forgotten. They refresh the river with new sediments which bring vital food and nutrients for insects, fish and plants. Braided rivers also clear



The lower reaches of the Ashley braided river as it crosses the Canterbury plains

away weed growth that can quickly invade and dominate the characteristic open shingle areas between the main channels.

Bird life

Due to these special features a unique indigenous eco-system has evolved in braided rivers over many thousands of years. The most obvious component today is the bird life. Riverbed birds such as the endangered wrybill, banded dotterel, black-billed gull and black-fronted tern have adapted to the highly variable flows and food supplies, the mobile substrate, the changing vegetation cover and the harsh climate.



The wrybill with a bill which turns sideways

For example, if eggs are lost in a flood they are able to re-lay within a couple of weeks. Their chicks are described as cryptic – grey and well camouflaged – so that they can be extremely hard to detect when instructed by their parents to lie prone among the greywacke stones. Perhaps the most unique bird is the wrybill, which breeds solely in braided rivers. It is the only bird in the world with a bill that turns sideways, designed so that it can access insect larvae from under the round river-rolled stones.

Thousand of years of life

There is another very special aspect about braided rivers. If you drive down south over the Canterbury plains, the scenery along that 300 kilometre stretch of flat land is totally different from that which was present when the first Europeans arrived four to five generations ago. Everything that you can now see above ground level – human structures, vegetation, animals and so on – would not have been there then.

It has all been introduced in the last 200 years – with one major exception. That exception is life on the braided rivers, which contain significant elements of the only original native ecosystems still remaining intact on the plains. The riverbed birds are the most obvious, and today they still breed annually in the same habitat that they have occupied for thousands of years.

However, and unfortunately, that situation continues to change. The birds have disappeared from large sections of the braided rivers, particularly in the lower reaches, and in many locations they are continuing to decline. This is due to a range of problems.

Water used for stock

The demand for water, mainly for stock drinking and irrigation, is increasing, so that river flows are reduced. This results in some of the rivers with smaller foothill catchments running dry over the summer months.

Dams on the major rivers, such as the Waitaki and Clutha, control flood flows to the extent that invasive weeds are not cleared from the islands and berm areas. These not only give cover for predators, but also force birds to nest on open ground closer to the main channels where loss of eggs



The open shingle areas are threatened by the invasion of exotic weeds, such as lupins

and chicks to peak flows is more likely. You only need to fly south over the lower reaches of the Rakaia and Rangitata to observe these open braided rivers and then to compare that with the next river south – the much dammed and weed-choked Waitaki.

Disturbance by people is also a problem, whether it is commercial outfits removing shingle or the public making use of recreational riverbed opportunities such as walking, swimming, boating and fishing. However, the biggest threat to the birds is the same that has caused so much catastrophic damage to other indigenous fauna and flora – predation by introduced animals such as stoats, weasels, ferrets, hedgehogs and wild cats.

Protecting their eco-systems

Although the eco-systems of braided rivers have been neglected in the past, fortunately the advent of water as the new gold has caused a revival of interest, and with that has come increasing recognition of their original and unique characteristics. In the opening pages of the Canterbury Water Management Strategy, it is made clear that the maintenance of indigenous ecosystems and their associated habitats is of higher priority than the supply of water for the likes of irrigation.

The strategy includes sustainable management and

regional approach as primary principles. A first order priority for regional approach is environment, with top targets of ecosystem health and biodiversity and ‘natural character, processes and ecological health of braided rivers’.

One major result has been the adoption by the Regional Committee of the Canterbury Water Management Strategy of a Braided River Flagship programme. A main aim of this is ‘maintaining and enhancing ... open braided river landscapes and protected bird nesting opportunities.’ The main target areas are the upper catchments of the Rakaia and Rangitata rivers, although the broad intentions spread to all parts of all braided rivers in Canterbury. In 2011 the Committee decided to allocate \$540,000 annually to the programme over five years.

A rarity in the rest of the world

These recent initiatives aimed at retaining and enhancing the natural characteristics of braided rivers are encouraging. However, as my father often used to say – recipes are great, but the proof of the pudding is in the eating. We all hope that the pudding ends up tasting good. If this is not the case, then braided rivers will not remain as something special. We will then regret that we did not take better care of a feature of our country which not only has unique endemic characteristics, but is also a rarity in the rest of the world.

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meet audit requirements. This can be a significant cost if, as in many cases, each retailer each have their own standards, certification system and associated costs.

Systems approach needed

Increased visibility and expectations on producers around animal welfare is only one component of ethical production systems and is accompanied by other standards around environmental stewardship and sustainability. Producers must meet all of these, in addition to more traditional economic reasons for increasing productivity. There is therefore a great deal of pressure for our farming systems to adapt.

This change must be managed in a context to minimise the risk of standards slipping in any one area. Research has an important role in understanding how farming systems work so that all the aims can be met in a viable way for the industry. An example of one of multiple pressures within a system is the pressure on the dairy industry to reduce nutrient loss and soil damage. There is also a continued need to increase productivity and improve efficiency of feed use. This has led to producers increasing the time that cows spend off the pasture in a variety of facilities, many of which are purpose-built.

This change in production system can have detrimental effects on animal welfare if not managed well, as research has shown that dairy cattle become stressed rapidly if forced to stand on concrete surfaces. Woodchips or bark are better for cow comfort, but the material can be difficult to obtain

and deal with after use and alternatives are needed. Solutions need to be found which achieve all the desired results.

Summary

Animal welfare plays an important role in shaping New Zealand’s reputation as an ethical producer of high quality animal-based products. It is a component of product quality and must be regarded as a cost of doing business, and also as an opportunity to differentiate and add value across a wide spectrum of this country’s products.

There is a growing need to maintain and develop our reputation in animal welfare to underpin New Zealand’s ability to grow wealth from our pastoral sectors. Our legislation has an important role in how our markets view our animal welfare practices. It also carries a number of research challenges in order to understand and measure welfare in our pastoral production systems.

Producers are currently faced with a multitude of pressures. These include animal welfare, environmental sustainability and production, and are being pulled increasingly closer to the public eye by retailer-based certification and auditing programmes. All of these challenges need to be managed in a systematic manner to ensure that no one spectrum slips and puts our international profile at risk.

Jim Webster is a senior scientist for Animal Welfare at the Ruakura Research Centre for AgResearch.

John Clendon

Oil palm developments

Charting a sustainable way forward



Although they are a world apart, dairy farmers in Waikato or Taranaki and palm oil farmers in Sumatra or Sabah are connected by palm kernel. Palm kernel is the seed, or nut, of the oil palm grown mainly in Indonesia, Malaysia and Thailand. Palm kernels are the origin of palm kernel cake, a supplementary feed used by many New Zealand dairy farmers in conjunction with silage and other meal-based supplements.

Many people are familiar with palm oil, which is extracted from the pericarp of the palm's fruit, and is now the world's leading source of high quality vegetable oil. Palm kernel oil, which is similar to coconut oil in properties and uses, is a secondary by-product derived from crushing the palm kernels.

The expeller, or palm kernel cake, from the kernel crushing process is used as a high-protein feed for dairy cattle and other ruminant animals. The nutritional composition of palm kernel cake is similar to that of corn gluten or rice bran, and its protein content makes it an ideal supplement for most ruminants. It is a versatile, easy-to-handle and good value for money. Unlike some supplementary feed options such as soybean meal and maize meal, palm kernel cake is not genetically modified – there are no genetically modified oil palms.

Although palm kernel cake is a popular feed supplement in New Zealand, its importation and use by local dairy farmers has sparked debate and protest from a number of environmental groups. They link palm kernel cake with global deforestation and related issues such as habitat loss.



Farmers delivering their fresh fruit bunches

Perception versus reality

There is a difference between the perception that oil palms are contributing to significant deforestation in tropical regions, and the reality. Deforestation is a serious environmental problem, but my observation is that oil palm cultivation is not a major cause.

Palm kernel itself is a minor by-product. Of all the products derived from palm oil cultivation, palm kernel cake makes up only 1.4 per cent. If you build an outside deck on your house, or buy garden furniture made from a tropical hardwood, this consumption probably contributes more to deforestation and destruction of orang-utan habitat than a dairy farmer using palm kernel cake as a supplementary feed for their cows.

During my many years in Malaysia I seldom saw primary jungle cleared to plant oil palms. However, I did witness the export of large quantities of rainforest logs to be used as construction timber and durable outdoor furniture. This logging industry has been in steady decline since the 1970s and 1980s, and today there are practically no valuable logs left to harvest in accessible areas. Once thriving sawmill towns and logging ports throughout south east Asia have long since closed down, as have job opportunities and economic growth prospects.

However there is a ray of hope. On the better quality logged-out land in high-rainfall tropical regions it is possible to grow oil palms. Not only is this cultivation providing an economic lifeline for many impoverished communities, it is also making an invaluable contribution towards satisfying the soaring global demand for nutritious edible oils.

Commitment to sustainability

During my involvement in the oil palm industry I have worked closely with small village farmers and cooperatives as well as vast plantations and research institutions. Based on that experience, I believe allegations that oil palms are responsible for the destruction of the global rainforest and loss of wildlife habitat are unbalanced and often incorrect.

According to the Food and Agriculture Organisation of the United Nations, of the 300 million hectares of forest lost globally between 1990 and 2010, only three per cent was planted with oil palms. That is not to say everyone in the palm oil industry is playing by the rules. In this respect, the industry is similar to New Zealand's dairy sector. However as an industry, palm oil producers are committed to promoting sustainable best practices and to penalise those who do not.

Certification

With the Round-Table on Sustainable Palm Oil, the industry has come together on a global basis to establish clearly defined sustainability benchmarks. As a true round-table, it is a diverse group including small farmers, larger producers such as Univanich Palm Oil PCL which is the company I work for in Thailand, researchers, regulators, bankers, manufacturers, and retailers, as well as environmental watchdog organisations such as the Worldwide Fund for Nature and the Rainforest Trust.

The directors of the round-table represent the wide range of members, and are responsible for monitoring the principles and criteria for sustainable certification. They also ensure, via an external auditing system, that certified producers maintain those sustainability standards. The principles and criteria apply to all industry include our company located in southern Thailand.

Promoting sustainable economic growth

During our company's early years in Krabi province, all fruit processed by our factories was from our own oil palm plantations. However, this in-house approach restricted our growth potential and limited the opportunity for economies of scale in our crushing mills.

We began encouraging neighbouring small farmers to plant oil palms on their family farms. While the response was slow at first, it soon gathered momentum as they recognised the potential of this new crop. They decided to convert their land from less productive crops such as coconuts, rubber trees, cattle grazing or rice farming.

Whereas 40 years ago there were no oil palms in Thailand, today there are more than 700,000 planted hectares, with 80 per cent of that area cultivated by small farmers each owning less than eight hectares. As a result, our business strategy has changed with small out-grower farmers becoming the main suppliers of fruit processed by our factories. Today our investment priorities include building new factories to process expanding fruit production, and oil palm breeding and agronomy research to help them increase crop yields.

Carbon sinks

As in Indonesia and Malaysia, the palm oil industry in Thailand has been an important catalyst for sustainable rural development. This conversion of land use contributes to the economic and social sustainability of rural communities. It also benefits the environment. As a perennial crop, oil palms do not require annual tillage and are a carbon sink compared with cattle pastures or rice fields.

Farmers are also realising other sustainability benefits. Along with higher agricultural productivity and consistent year-round income from harvesting twice a month, oil palm farming is much less labour-intensive than competing crops. For example, one farmer can manage around eight or nine hectares of oil palms, whereas one person can look after only one or two hectares of rubber trees. In areas where urban migration has resulted in an ageing rural population, the lower labour requirement is encouraging many small family operations to convert to oil palms.

Environmental sustainability

Just as forward-thinking New Zealand farmers conserved areas of native bush, responsible oil palm growers are setting aside reserve areas. The certification process includes strict third party auditing of reserve areas deemed to be of high conservation value.

Before oil palms were planted, logging usually occurred in several phases over 15 to 20 years. Loggers started with high-value trees, the orang-utan canopy habitat, and eventually removed all trees down to a girth of around 30 centimetres. To the untrained eye, the forest appeared intact, when in reality the cover was mostly bamboo and secondary growth, with the original plants and animals mostly long gone. High conservation value reserve areas may include pockets of lightly logged land or those which are habitats for endangered plants and animals.

In New Zealand, we were slow to realise that some steep hills should not have been cleared of native cover because soil erosion and catchment damage soon became major environmental and economic problems. The oil palm industry is trying to avoid these mistakes. Riparian reserves along waterways have become a standard practice, sloping land is terraced to reduce erosion, and legume cover crops are planted to protect the soil and conserve fertility.

The oil palm industry is aware of changing climate trends and the possible threat posed by rising greenhouse gas emissions. When replacing pasture or paddy fields, oil palms may be a carbon sink, but there are other areas of concern where the industry is working to limit these emissions.

For example, peat land development can be a big source of emissions. However, planting oil palm on peat soils has either been banned under sustainable palm oil rules or tightly restricted, depending on the depth of the peat and the water management measures.

Methane capture

Palm oil factories, also known as crushing mills, produce large amounts of waste water known as palm oil mill effluent. Traditionally, this was treated in deep anaerobic wastewater ponds similar to effluent treatment systems used on New Zealand dairy farms, and emitted large amounts of methane biogas.

To solve this problem Univanich now captures methane and generates renewable energy at the three palm oil mills to. So far these projects have generated 35,000 megawatt-hours of electricity for supply to the national grid. At least 3,000 households in Krabi province now receive their power requirements from this project, instead of from the grid's coal-fired power stations. The projects have generated

approximately 90,000 certified emission reduction units, equivalent to 90,000 tonnes of reduced carbon emission.

Social sustainability

A robust agricultural base is an important foundation of sustainable economic growth, and Krabi province's recent history backs this up. In 1973, when Thailand's first palm oil mill was built, Krabi was politically unstable and often dangerous.

However, as investment in oil palm and rubber plantations stimulated the economy, poor rural communities had new employment opportunities and increased prosperity. The security situation improved, infrastructure expanded and the region attracted other industries. After the success of agriculture, tourism was the next important industry to develop, providing many new opportunities for a wider cross-section of the community to improve their lives.

Environmental sustainability remains a crucial focus because our customers demand it. Recently, the Univanich-Plaipraya Enterprise Group, a group of smallholder suppliers to our mills, became the first independent smallholders in the world to receive Round-Table on Sustainable Palm Oil certification as sustainable producers. Following the success of oil palm business in Krabi, the children of our first employees are now returning from advanced education to work for us as engineers, agriculturalists, accountants, and in many other roles.

We would like to export this oil palm transformation story to communities with similar growing conditions and development needs. A recent study trip to Mindanao in Southern Philippines revealed such an area similar to Krabi before the arrival of oil palms.

Extensive logging, followed by slash and burn agriculture, has already devastated much of that environment. Political instability and poverty tend to follow hand-in-hand. However, some far-sighted leaders are now looking to the oil palm industry as possible means to restore the economic and social sustainability of their communities.

John Clendon works for Univanich Palm Oil in Thailand. Univanich pioneered the first palm oil plantings in Krabi in 1969 and now employs more than 1,200 people and produces nine per cent of Thailand's crude palm oils.

Palm oil growth rate

The palm oil industry has expanded rapidly over the last 20 years. In 1990 palm oil was 14 per cent of the global supply of oils and fats. In 2010, the palm oil slice of the pie increased to 26 per cent, around 170 million tonnes, and continues to rise and is a \$20 billion a year industry.

Most palm oil and its by-products come from Indonesia and Malaysia, who together produce close to 87 per cent of global output. On an annual basis, Indonesia produces around 29 million tonnes of crude palm oil, while Malaysia's contribution is 19 million. Thailand is a long way back in third place with annual production of 1.8 million tonnes.

In terms of use, refined palm oil is popular as cooking oil. It is also found in a range of food products including margarine, breakfast cereals, confectionery and baked goods as well as soap, washing powder and cosmetics. Over the past decade, due to increasing concerns about the effects of fossil fuels on climate change, palm oil has become increasingly popular as a biofuel – 10 per cent of all oil produced last year was used fuel.

Adam Barker and Annabel Crow

Adding value to client discussions with DairyBase



DairyNZ recently completed a comprehensive survey of 150 top-performing farms in the Waikato and Canterbury. The survey identified seven main factors common among these operations. The top common factor is benchmarking. The farmers surveyed saw significant value in comparing their operation against others to learn and improve.

The other six common factors among these farms discovered in the survey were in order –

- Commitment to budgeting
- Confident decision-making
- Regular networking
- Couples managing the business
- Having a dairy background
- Reliable plant and equipment.

Advisors have what it takes to add value to their dairy farming clients when it comes to the top three factors. DairyBase can help advisors with benchmarking, budgeting and decision-making solutions. This looks into the types of reports produced by DairyBase and how they can be used to help add value for clients.

What DairyBase is

DairyBase is a web-based system which records and reports standardised dairy farm physical and financial information. It analyses farm information using performance indicators and benchmarks. A DairyBase report is a resource for farmers and their advisors to use for farm planning and identifying opportunities to improve performance.

Developed by DairyNZ, DairyBase was launched in 2004 and is now used by around 100 dairy farm business advisors and their clients across New Zealand. Nearly 2,000 dairy farms are registered in the system and are using DairyBase to understand their past business performance and plan for the future.

Before using any DairyBase report it is necessary to first recognise how the information fits within a client's business and the people involved. This is important because it ensures that information is representative of the business and is accurate. By focusing on the business in an holistic manner it is possible to use DairyBase information to review the farm's performance in the context of the operator's wider business and personal aims. This ensures you are looking at the right areas within the business in terms of which components require re-evaluation and improvement to build a stronger business.

Reviewing reports

Once the client is enrolled in DairyBase for a season and starts to generate reports, the advisor will talk through the information within them. However, this is where

the data can get a bit overwhelming. The easiest way to review a report is to break the information down.

For financial information, this is done by going through four questions which cover the main performance aspects of a business. This is a process which can be applied to any business –

- How would you describe this business?
- What is the financial position?
- What is the cash flow?
- What is the operating efficiency?

Moving through the four questions, the review concentrates on performance indicators relating to respective parts of the business. To demonstrate how to work through these questions with a client, the following illustration will use an example farm to show how to review full financial report and extract relevant information.

How would you describe this business?

When describing the business, the objective is to understand the physical parameters involved because they –

- Underpin all analyses and reports in DairyBase
- Give context to the financial information
- Classify the farm into benchmark groups.

The example farm used in our illustration can be described as –

- Owner-operated farm located in the Manawatu in the lower North Island
- For the 2011-12 season peak cows milked were 730,

producing 329,960 kilograms of milksolids supplied to Fonterra

- Has an effective dairying area of 255 hectares and an effective support block area of 80 hectares
- Calving in spring and milking twice a day
- Operating a production System 4, importing 20 to 30 per cent of total feed, mainly to extend lactation and for dry cows
- Employing 3.4 full-time labour units, with the farm owners equating to 1.4 labour units, which are unpaid
- Unless otherwise stated, having the benchmark Top 20 per cent of owner operators in New Zealand, based on dairy operating profit per hectare. This benchmark has been chosen because the business wants to challenge their current performance and identify opportunities to improve. Comparing themselves to this benchmark will allow them to do that.

The questions would now be –

- What are the reasons behind the reduction in cows and milksolids per hectare?
- What factors have resulted in the increase in cows and kilograms of milksolids per full-time equivalent?
- What are the production targets for the business, given how they compare with the benchmark?

What is the financial position?

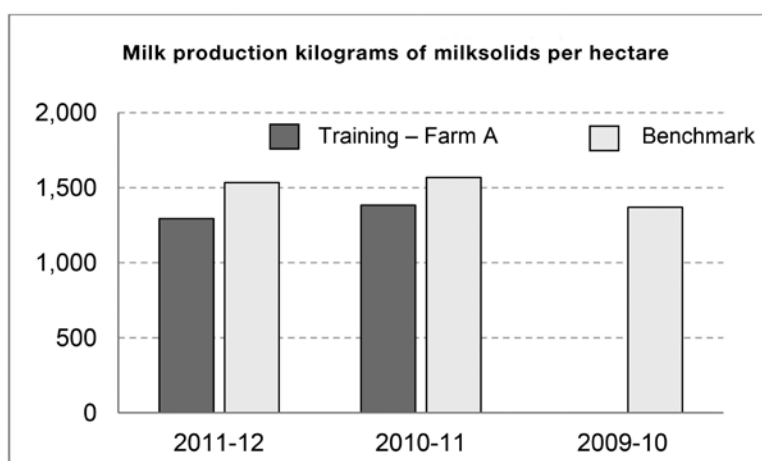
The focus, when reviewing the financial position, is on the size of the business and how the assets are comprised, the level

Physical key performance indicators – Training Farm A

	2011-12	2010-11
Cows per hectare	2.9	3.1
Kilograms milksolids per hectare	1,294	1,383
Kilograms milksolids per cow	452	446
Cows per full time equivalent	152	141
Kilograms milksolids per full time equivalent	68,742	62,961

Stocking rate and milksolid production per hectare have all decreased compared to the previous season.

While milksolid production per cow and labour indicators have increased.



Milksolids production for 2011-12 is 1,294 kilograms per hectare, below the benchmark of 1,500 kilograms per hectare.

The benchmark is top 20 per cent of owner operators in NZ based on dairy operating profit per hectare.

of liabilities, the relationship of dairy to total business and the contribution of profit or capital change to equity growth. The next chart provides a snapshot of the size of the business, the make-up of the assets, the amount of liabilities and total equity at the end of the financial season.

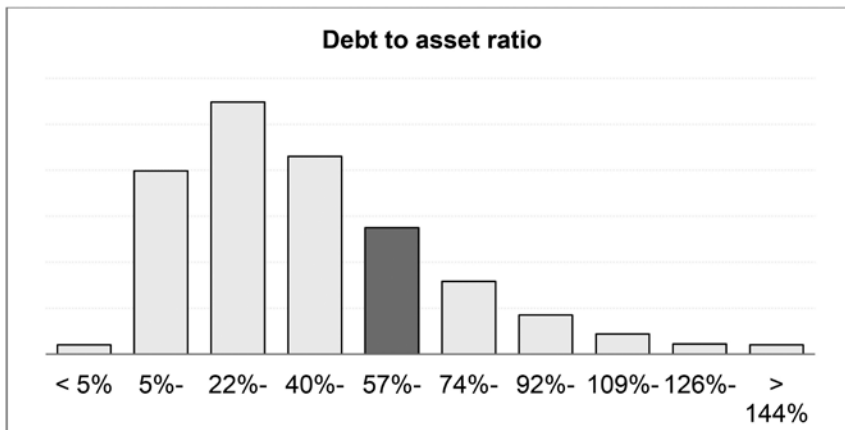
As at May 2012					
Assets		Dollars	Liabilities		Dollars
Dairy livestock		1,942,265	Current liabilities		253,870
Plant & machinery <small>(inc office equipment)</small>		583,022	Less current assets		-210,475
Dairy land & buildings <small>(inc. runoff)</small>		4,263,000	Term liabilities		4,958,000
Dairy company shares		1,583,582	Total liabilities		5,001,395
Other dairy investments		33,590			
Total dairy assets		8,405,459			
Off farm/non dairy assets <small>(livestock, buildings & land etc)</small>			Equity		3,604,064
Other investments		200,000			
Total non dairy off farm assets		200,000			
Total assets		8,605,459	Total liabilities plus equity		8,605,459

This table shows the financial position of the business.

Total assets amount to \$8.6 million which includes \$200,000 of off farm assets.

Liabilities are \$5 million and equity \$3.6 million.

The next charts provide further detail on the level of liabilities.

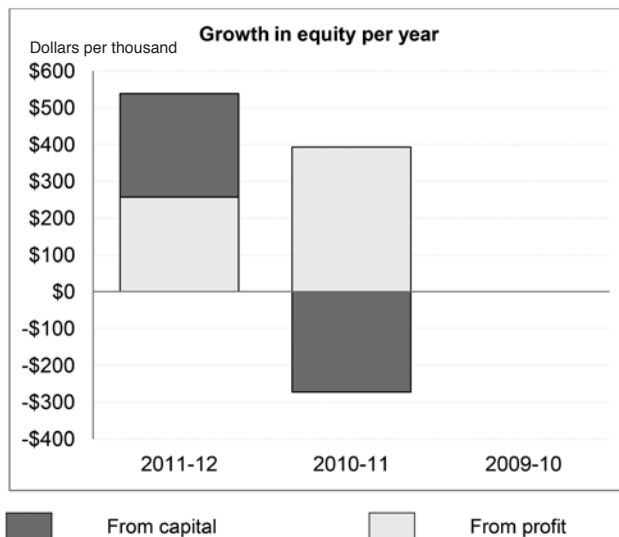


The debt to asset ratio for this farm is 58 per cent.

This means that 58 per cent of the assets are funded by debt and 42 per cent by equity.

The farm is being compared to a model of lower North Island owner operators and shows the distribution of debt to asset ratio.

In order for a business to grow equity, it must either generate a profit achieve capital growth from the assets owned. This chart provides a breakdown of how wealth was generated.



In 2011-12 the business had growth of \$256,000 from profit (light grey) and \$281,000 from capital (dark grey).

In 2010-11 the business had growth of \$393,000 from profit (light grey) and negative \$272,000 from capital (dark grey).

The discussion topics would be about the financial position –

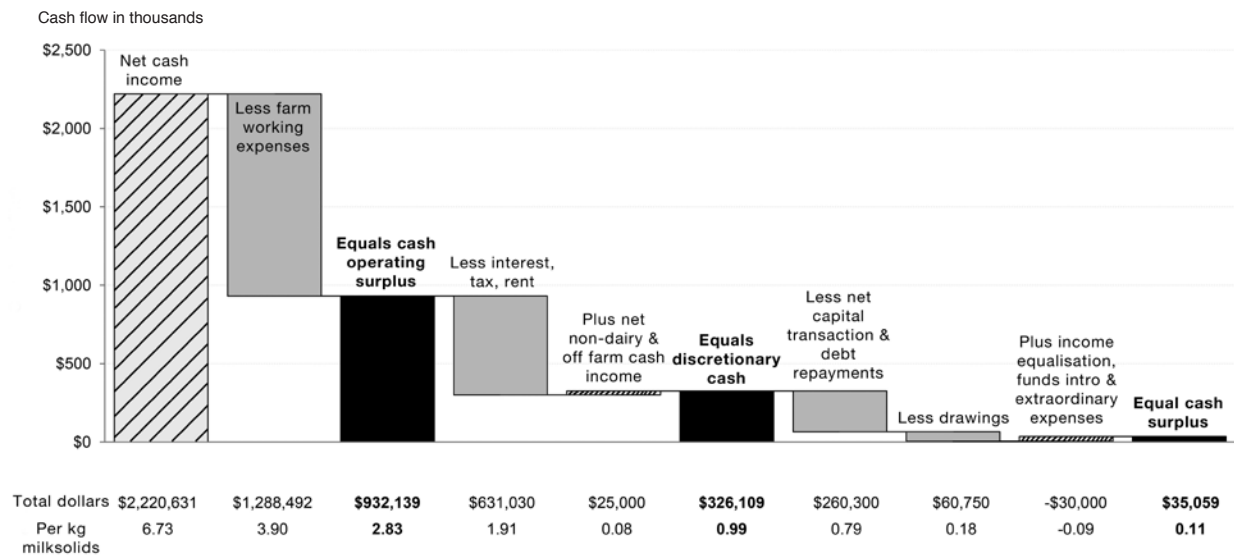
- What is the \$200,000 of other investments and what role does it play in the overall business?
- What level of liabilities is sustainable for the business?
- Can the business continue to achieve growth from profit?

What is the cash flow?

Cash flow describes the movement of cash in or out of the business including non-dairy and off-farm transactions. The focus is on following the flow of money to assess the ability of the business to –

- Service debt
- Cover costs such as tax, personal drawings, capital purchases
- Produce 'free cash' for re-investment or debt reduction
- Identify any funds withdrawn or capital introduced.

The chart below summarises the cash flow during the season. Striped bars indicate cash coming into the business. Grey bars indicate cash leaving the business. Black bars are the sub-totals at different stages.



The discussion topics would be about the cash flow–

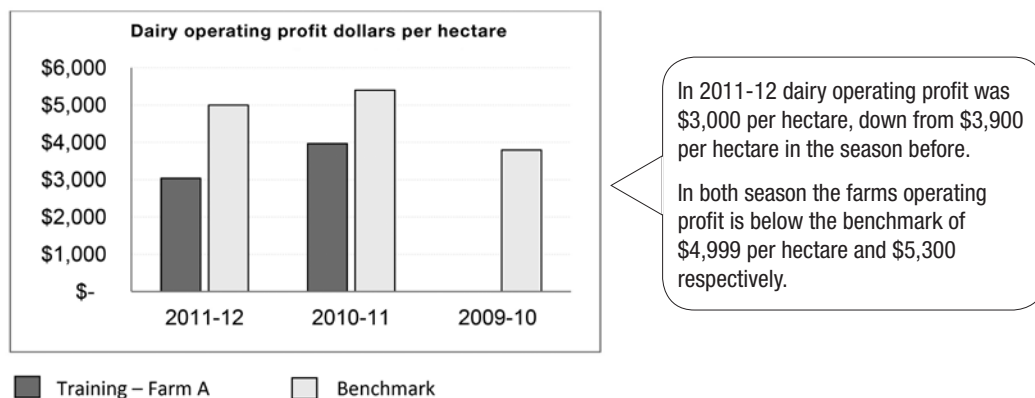
- Do the business owners have a level of discretionary cash they want the business to produce?
- What would the cash flow look like at different milk prices?
- Are the non-dairy or off-farm income and funds introduced likely to continue, and if so at what level?

What is the operating efficiency?

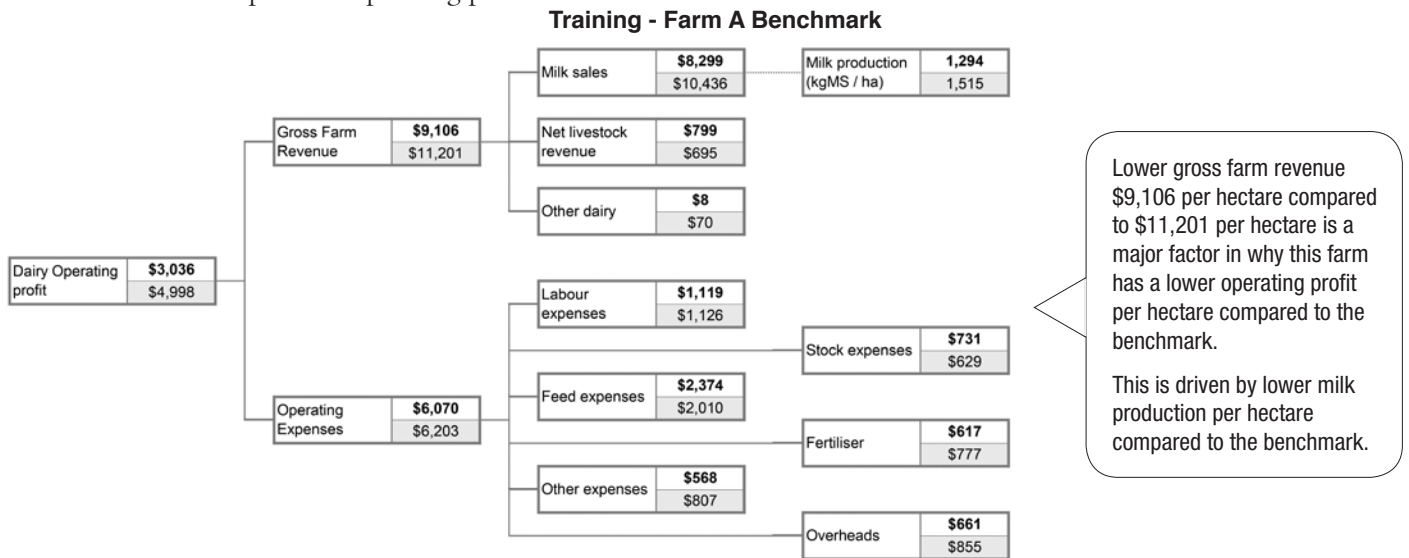
Operating efficiency concentrates on the ability of the dairy business to generate an operating profit and the efficiency of the assets employed. Attention is given to –

- What produces operating profit
- The return generated by the assets and funds employed for the dairy and whole business
- Specific income and expense categories

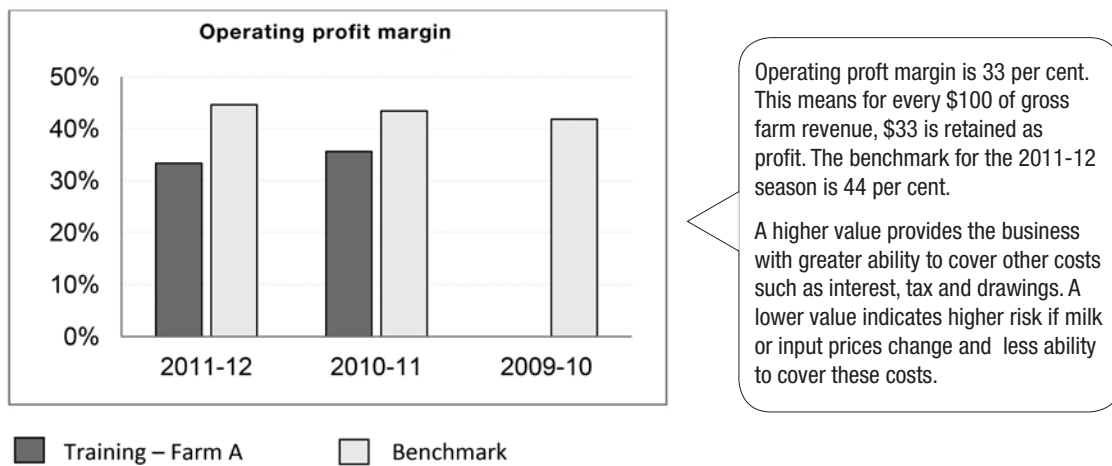
Dairy operating profit is a measure of farm profitability used for benchmarking comparison between dairy farms as demonstrated in the following graph..



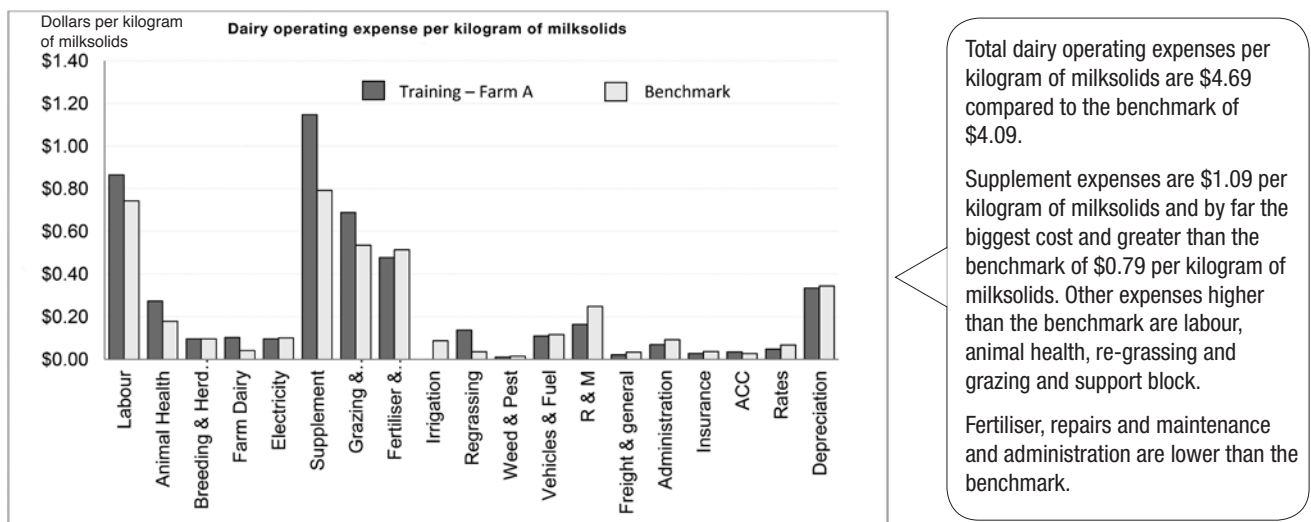
Breaking down the operating profit equation using the profit driver tree allows us to identify the factors which produce operating profit.



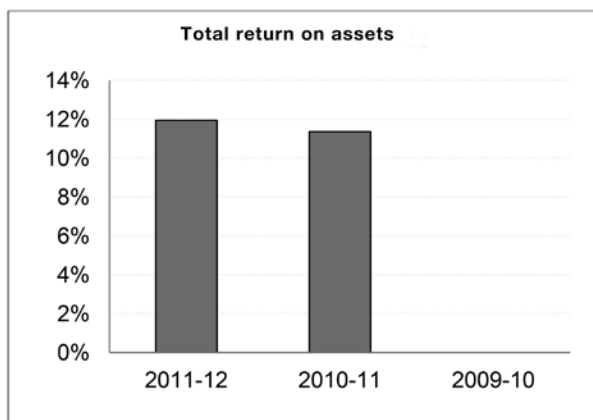
Operating profit margin shows what proportion of the gross farm revenue of the business is left after dairy operating expenses are accounted for.



To gain insight into which expenses differ from the benchmark and those that make up a large proportion of the expenses, the following chart itemises operating expenses per kilogram of milksolids.



Total return on asset measures the overall financial performance of the business as shown.



This business achieved a total return on asset of 12 per cent.

Total return on asset takes into account returns generated from dairy and off farm investments, and changes in all assets values, due to movements in capital.

The discussion topics would be about operating efficiency –

- Is the benchmark group appropriate?
- What operating profit does the business want?
- Can profit be improved by increasing revenue, decreasing expenses or both and where do the opportunities lie?
- Is the operating profit margin suitable in relation to risk?
- Supplement expenses make up a large portion of total expenses, what is the policy around supplement use and purchasing decisions?
- What other expense categories warrant attention?
- Is the business happy with the return they are achieving and what is the long-term target?

Discussion and action

A comprehensive picture of the business and its performance and identified a list of discussion questions has now been built up. The focus then turns to –

- Developing a plan to and discussion with the farm business owners about the business performance
- Linking discussions with business and personal goals
- Using the discussions to create an action plan.

This is where DairyBase starts to take hold, with the

opportunity to move from the advisor role to that of a facilitator. A facilitator's role requires a different set of skills and we now offer training to users wanting to enhance their facilitation skills and the way they use DairyBase with their clients.

Where to next?

If the advisor and the client are sold on the idea of benchmarking, and see the value of using the four-step process above, what is the next step? Getting a dairy farming client enrolled in DairyBase is a good place to start. Once the client has a season's worth of data in the system, the advisor can get started generating a range of reports, including graphs and charts, which make it easy to analyse and discuss their farm business information.

Reports are generated in a way which allows users to select a variety of different benchmarks. These benchmarks are used to identify areas of strength and or diagnose problems in performance. Benchmark comparisons can also be part of good practice for reviewing progress from year-to-year.

Adam Barker is DairyBase Manager at DairyNZ in Hamilton and Annabel Crow is Business Developer.



Members' responsibilities if acting as an expert witness

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I was asked recently to review the main lessons from one of the cases in which a member was employed and gave evidence as an expert witness before a planning tribunal. Comments on this case follow, but the basic information about the NZIPIM's complaints system is set out first.

Any complaint which alleges that a breach of the NZIPIM Code of Ethics must specify which rules have been breached. The code of ethics and rules of conduct are written under the headings that involve –

- Compliance with standards
- Professional duty
- Competence
- Conflict of interest
- Confidentiality
- The profession.

The rules of conduct are contained in numbered rules with sub-sections. These should be viewed directly and each member has the personal and professional responsibility of making themselves fully aware of the code and these rules.

A complaint is made

If a complaint is made, the current process involves the setting up of a complaints committee to determine whether the complaint is proved and if there is a case to answer. For less serious matters a recommendation will be made to Council for appropriate action. This may mean a reprimand or contribution to cover costs of the hearing.

For serious cases where continued membership or registration might be at stake, the matter will be referred to a full hearing of a board set up by Council. This board also deals with any appeals from a decision by the Complaints Committee, but these are limited to matters of law or process.

Making a decision

In arriving at its decision, the Complaints Committee must consider and decide on 'whether there has been a breach of professional duty and responsibility.' That is, has the member acted in the manner which was different from what a similarly instructed Registered Consultant would have done in the same circumstances having with reference to all the relevant facts and matters involved?

Under professional duty, the NZIPIM rules cover the requirement to render services to a client and employer with fidelity, integrity, honour and professionalism, acting impartially and objectively when providing advice, and having respect to the public interest. Any conflict of interest, or potential conflict of interest, must be disclosed.

Members at all times should conduct business in a manner befitting their profession and in accordance with reasonable public expectations of professional persons. When acting as an expert witness, advice must be impartial and no professional should act as an advocate.

Background to a recent complaint

The Complaints Committee was involved with a hearing against a Registered Consultant who had given evidence at a Ministry for the Environment Board of Enquiry established to deliberate on an application for resource consent for a major project. The claim made by an affected third party was that there had been a breach of the NZIPIM's Code of Ethics.

While the specific details of this case and the identity of those involved are not being disclosed, there are matters from which all practising consultants could learn. This complaint related to the testimony and evidence of 'X' in relation to the Code of Ethics and Rules of Conduct (Appendix V).

It was specifically alleged that X breached the following requirements.

Section 1.3

Members shall not accept an assignment that is contingent upon, or influenced by: any condition or requirement for a predetermined result where the exercise of objective judgment is required. Members shall maintain the strictest independence and impartiality in undertaking their professional duties. To this end, no member shall:

- (a) Adopt the role of advocate in a case where their duty is to exercise independence and impartiality;
- (b) Allow the performance of their professional duties to be improperly influenced by the needs or preferences of a client or other party;
- (c) Rely upon critical information supplied by a client without appropriate qualification or confirmation from other sources;
- (d) Act in any other way inconsistent with the duties of independence and impartiality.

Section 1.12

In reports, members shall include references to any relevant assumptions, condition requirements and limitations arising from their instructions or inquiries, or imposed from any other source.

Section 1.15

Members shall accept full responsibility for the content of their reports. Where the report relies on professional opinion from outside experts, that reliance must be acknowledged.

Section 3.2

Members shall conduct themselves in a manner and demeanour which is neither detrimental to their profession, nor likely to lessen the confidence of clients, or the public, in the Institute or the profession.

Ethical considerations

The Complaints Committee must judge any complaint against the Code of Ethics and Rules of Conduct. In some cases a breach of these is quite clear and can be objectively measured. In other cases it is a value judgement. Consideration must be given to the member's impartiality and independence. Their conduct and demeanour are also considerations. Their performance in this matter is being

judged by two of their peers and an independent person.

High standards of conduct are expected from registered members taking on expert witness roles. In accepting any engagement to act as an expert witness, the consultant takes with them the responsibility to be bound by the rules and Code of Ethics and to act professionally.

Main messages

While these points did not all arise from this particular case, the following is summarised as a reminder for all members.

- The conduct and demeanour of a member appearing in any public setting must be professional. High standards are expected as the whole profession will be judged. Care needed to respect the views and opinions of others without being arrogant or dismissive.
- Be clear, concise and professional at all times. Deal with the facts and avoid simply defending your initial position if challenged.
- As an expert witness the consultant's evidence will be given significantly greater weight than lay evidence.
- An expert witness must display an unchallengeable level of impartiality. The statement that any effect of works 'will be no more than minor' is a very strong statement and one that any appointed tribunal will probably rely on when making their decision. It needs to be well qualified to cover in what respect it is minor, whether financial, economic or other. If there are personal effects on an owner these should be at least acknowledged.

Any consultant needs to recognise that –

- They should never act as an advocate and the level of impartiality should not be influenced by the requirements of the client
- Any evidence given must refer to any relevant assumptions, conditions or requirements arising from the instructions
- The consultant must take full responsibility for the content of their report, including any reliance on outside expertise
- If the report is based on any 'as yet undefined or yet to be negotiated conditions' considerable extra care is required that the qualifications or assumptions are clearly outlined.
- Be very careful and well considered before reporting and concluding that 'any effect will be no more than minor'.

Conclusion

Every member of the NZIPIM has a duty of care, and a responsibility to their professional peers, to conduct themselves in accordance with the code of ethics. The public will judge members, and the profession as a whole, by the actions of an individual member and by the demonstrated professional judgement used when undertaking any assignment. When acting in the capacity of an expert witness a member must therefore display an unchallengeable level of impartiality and professionalism.

David Baker is a Registered Valuer and Registered Agribusiness Consultant. He has been involved with the majority of disciplinary complaints against Registered Members.

Findings from survey regarding pasture assessment method

This survey was undertaken as a result of a complaint being received against a Registered Consultant who is a member of the NZIPIM.

- 1 The appointed Complaints Committee undertook a confidential survey of senior NZIPIM members involved with dairy consultancy. The purpose was to establish 'appropriate professional standards and normal practice for the assessment of pasture cover to be provided in any sale and purchase agreement'. Summarised below are the main findings from the survey and these are intended to become recommended standards to NZIPIM members. The standard formula used in a plate meter reading is height, where a click is one centimetre in height, multiplied by 140 plus 500 to establish the dry matter per hectare of rye grass. Different formulae were used previously for different times of year, but these have now been dropped in favour of one calculation.
- 2 It should be common practice that, in a sale and purchase agreement, the exact calculation method is inserted in the relevant clause to avoid any misunderstanding.
- 3 When assessing pasture cover for a sale and purchase agreement, this should be by objective measure using plate meter readings as a clear way of establishing a given volume. Visual judgment may be required in exceptional cases such as pugged paddocks and these will then become the best professional judgement and should be noted as such.
- 4 Any calibration of eye assessment for general consultancy purposes would be by reference to the animal consumption, the actual performance of the stock, any supplementary feed used, and back calculation of residual pasture cover numbers against consumption with what a plate meter might be reading. However this is not appropriate for sale and purchase agreements.
- 5 It is useful with plate meters to ascertain which model is being used. Is it a mechanical original type which only has height measured, which is then converted manually by calculation? Or is it a more modern version which is electronic in nature where formulae can be changed? It will read out every paddock volume when it is pre-loaded with a formula such as height times 140 plus 500. The main models used are the Farmworks plate meter or Jen-quip, both use similar systems.
- 6 When receiving an instruction to assess pasture cover with a sale and purchase agreement. The recommended approach should be to –
 - Clearly insert in the sale and purchase agreement the method of assessment, such as by electronic plate meter using the formula height times 140 plus 500. If this is not available, the consultant should establish, with both parties in advance, the method of calculation to be followed.
 - The consultant should check and confirm that both parties have signed the sale and purchase agreement and then act strictly on the method of assessment clause conditions.
 - They should appoint a suitably qualified person, who is independent of both the purchaser and vendor, to assess the pasture. This will avoid any perceived bias in favour of either party.
 - Invite all relevant parties on the day on which the measurement is to be made for a farm sale and purchase agreement, and for sharemilker changeover agreements, so that all are clear on the method adopted and can see that the readings were in accordance with the agreement.
 - In the sale and purchase agreement, as is typical with a sharemilking agreement, a deficit clause should be inserted which allows for a calculation to take place as to how a deficit may be calculated if pasture cover is below the required amount as set out in the sale and purchase agreement.
 - Deficit calculations may be made in the form of additional nitrogen, feed supply or other, and the exact method of calculation and product which is acceptable to both parties, should be set out clearly. For example, xyz tonnes of urea at a response rate of 10:1, or xyz tonnes of PKE or xyz tonnes of baleage.
 - The volume of pasture at end of farming agreements can be contentious and every effort should always be made to have all parties present on the day of measure. Having said this, providing the steps above are taken, appropriately qualified consultants should be able to be relied on to accurately perform the task at hand.
 - Establish an agreement on volumes within the same day, and follow this up with a confirmation note stating that the terms and conditions of the relevant clause have been met or adjustments being made by mutual agreement.

Stephen Wood

Professional indemnity Do I need it?

Indemnity insurance

Indemnity insurance

Indemnity insurance

Indemnity insurance

Indemnity insurance

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insurance

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Indemnity insurance

Agricultural consultants are professional problem-solvers. They provide support and solutions for their clients to enable the farm business to run as efficiently and effectively as possible. Occasionally there are situations where a client may hold them responsible for a piece of advice they gave which caused them financial loss. As part of their risk management plan, agricultural consultants can protect themselves with professional indemnity insurance.

Agricultural consultants are experts in their field, and they use scientific and productive analysis to provide solutions for their clients. The advisory and consultancy role is split into two inter-related areas –

- Technical consultancy providing specialist advice on agronomy, nutrition, waste management and other technical applications
- Business consultancy involving business planning, personnel management and financial advice for the agricultural business and farms.

Insurance requirements

Agricultural consultants give advice to their clients to help them in their business decisions. Clients get the most out of the professional knowledge and in return give repeat custom. Traditionally, when professionals look at their commercial insurance requirements they usually consider –

- Material damage
- Commercial vehicles
- Liability public, statutory and employers
- Personal income life risk insurance.

Material damage covers accidental loss of or damage to insured property. Cover is available for buildings, contents and stock at an address stated in the insurance schedule. Portable equipment such as mobile phones, laptops and surveying equipment can be covered anywhere in the world, and in transit. Some companies cover portable equipment on a full replacement value and some on indemnity.

Comprehensive commercial vehicle insurance covers vehicles for accidental loss and liability to the public. Cover can be limited to third party liability or it can be extended to cover accidental loss due to fire and theft.

Public and products liability, often referred to as general liability, covers legal liability to pay compensation to third parties for personal injury or damage to their property. Statutory liability insurance is taken for protection from fines and defence costs if prosecuted for inadvertent offences under an Act of Parliament. The most common breaches affecting New Zealand businesses occur against health and safety, and the Resource Management Act.

Employers' liability cover claims against employers made by employees for injuries or illness suffered in the course of their employment and which are not covered by the ACC legislation. This can cover problems such as stress, mental injury and long-term exposure to chemicals.

Personal income insurance can cover for loss of earnings when unable to work due to injury or illness. Businesses can also be covered for death or injury of a key person.

These policies do not provide coverage for contract performance disputes. As a professional giving advice for a fee, there is exposure to professional indemnity liability. Professional indemnity insurance is a form of insurance offered for those providing advice or professional services, following a breach of professional duty by way of neglect, error or omission. It protects you and your company for –

- Legal costs and expenses associated with the defence of legal action
- Settlements or judgements against the business or person arising out of negligent advice or service.

A professional cannot ignore an allegation of professional negligence. It must be either admitted or defended and will have cost implications. Professional indemnity insurance provides a safety net when all else fails.

Professional indemnity insurance

You may ask if you need professional indemnity insurance. The simple answer is yes if you are charging for professional advice. Situations arise when the client may feel that the advice given and acted upon has caused a financial loss. Once a client has alleged a financial loss then legal proceedings may begin. It does not matter if you are negligent or not – the legal defence will need to be paid.

Unlike many other liability policies, professional indemnity policies are claims made policies. That means that making the claim is the insured event. So it is important that the insurer is notified early of any claim so that it can participate in any investigation, defence and negotiations. There must be a policy in place at the time of the claim, irrespective of when the work was actually undertaken or when the alleged act of negligence occurred.

A professional will buy professional indemnity insurance for their own protection. The only criterion for there being a need for professional indemnity claim is for the client to feel that a financial loss is caused by the advice given. It is up to the client to prove that it is the consultant's negligence which led to the loss and the onus is on the consultants, via the insurers, to prove it was not, or to negotiate a settlement.

These are four examples of possible scenarios.

- A client wishes to increase their herd size, and rather than buying in heifers they are advised to use the 'sexed semen' being offered. The in-calf rate plummets. The client may argue that a financial loss is the fault of the consultant not explaining the reduced fertility of the semen.
- On the advice of a consultant a client uses a hormone treatment which causes a side-effect that means they cannot sell their goods. Could this be a financial loss due to negligence?
- A consultant arranges for soil and blood analysis. The test results showed a selenium deficiency in the soil and the blood. The farmer was advised to improve the levels in the soil by adding selenium to the fertiliser. Using the consultant's calculations, fertiliser containing added selenium was spread on to the paddock. A few days later several horses grazing on the land fell ill and later died as a result of selenium poisoning.

- A consultant advises their client to switch their contract to another energy provider on a five-year contract which saved the clients thousands of dollars. Four months later they received a quotation from their old supplier. Because the energy price had fallen, the new offer would have saved them more and only have tied them into a two-year contract. They were unable to switch without paying a cancellation penalty.

In all of these cases outlined above it does not matter whether or not the consultant was to blame, there are defence costs to cover. There may be scientific tests to carry out, expert witnesses to be called, investigations to be held, and all of these cost money.

Professional indemnity insurance provides limited cover against the consequences of claims of negligence. It is important to have contractual limitations agreed between the professional and their client, otherwise there may be no limit to the amount or the time period covered.

The limit of indemnity is the maximum amount that can be claimed from insurers for the liability to pay damages. Defence costs are sometimes paid in addition to the limit. The limit of indemnity operates in one of two ways. Each and every claim cover, which means the limit applies separately to each claim. Aggregate cover means the limit would apply as a single amount for all claims made in the period of insurance.

Adequate insurance cover

It is important to understand the extent of any policy coverage and the insurance requirement. Policy cover is always subject to the terms, conditions and exclusions of the insurance contract and policy wording provided by the insurer. Understanding the limitation is vital to ensuring adequate protection in the event of a claim.

Professional indemnity claims tend to occur after the service has been provided and this may be many years later. If the policy has expired or been cancelled you may not be covered. You may have to keep your professional indemnity insurance current for several years after you leave the profession or retire.

The same problem also arises if you switch insurers and someone makes a claim against you from a time you were insured by your former insurer. Your new insurance policy may not protect you. Be aware of this when switching insurance companies and ask your new insurer what provisions they have in the event of this happening.

Each insurance company has their own policy wording, and this can mean coverage may vary considerably. It is important that you and your insurance broker or agent compare each policy based on the appropriateness of cover for individual business needs and not just the costs.

It is important that consultants protect themselves by using professional indemnity insurance as part of their risk management programme. It should be the foundation of every consultant's insurance portfolio.

Stephen Wood is a commercial broker at Rothbury Insurance Brokers in Whangarei.

Profile

Wayne Allan – President of the NZIPIM

Wayne Allan is a Registered Member and current President of the NZ Institute of Primary Industry Management. He lives in Lincoln and established Allan Agricultural Consulting Ltd after leaving Landcorp in 2008. He spends about half of his time working in the deer industry and the rest with sheep and beef.

Wayne was brought up in Invercargill and with both parents from farming, agriculture appeared to be in the blood. From a young age he enjoyed many school holidays on the properties of his grandparents and other relatives, and was grateful for the opportunity to help out on the farm. During secondary school he also spent time working on a forestry block owned by his father, who often told him that if he had not become a surgeon he would have been a farmer.

With a love of the land and an interest in science gained while attending Southland Boys' High School, Wayne studied agricultural science at Lincoln University, completing his honours degree in 1989. He started his career with MAF Technology and was one of the final intake into their national consultant training schemes. The 13 weeks of training, interspersed with in-field placements, were invaluable for a new graduate. Studying in science and farm management did not provide a lot of exposure to the softer skills required for consulting.

Tough times

Wayne was placed in Ashburton, mid-Canterbury, which he felt was a good province to learn a range of skills with its established sheep, beef and arable, along with rapidly growing dairy and deer industries. However, the province then had around 24 farm advisers working between the Rangitata and Rakaia rivers within MAF, and at that time it was not a good idea to venture too far into the neighbouring patch.

The early 1990s were tough times for agriculture in New Zealand. Farmers were still coming to grips with the removal of subsidies, the East Coast was hit with major droughts and snow, and interest rates were extremely high. Some good farmers were helped to leave their farms. Understandably it took a little while for a young consultant to find his feet.

One of the most valuable experiences for Wayne was working on the MRDC Monitor Farm, alongside Grant White, the MAF area manager, and Hugh Eaton. It provided great support, but also the opportunity to analyse what made the farm really tick and present to large groups. When AgResearch made Stock Pol available, the predecessor to

Farmax, it quickly added value to the focus farm discussions. Farmax is a tool Wayne still uses regularly.

Landcorp experience

When Wrightsons bought Agriculture New Zealand in 1995, Wayne took up a position as Operations Manager with Landcorp in Invercargill. What was a five-year plan to gain experience in farm supervision turned into 13 years of professional and personal growth.

Landcorp, and particularly the General Manager Bernard Card, knew that their biggest resource was staff and invested in their training. The time with Landcorp taught Wayne how to think more strategically, grow more robust businesses, and to empathise more with individual circumstances.

In 2004, he became the Senior Operations Manager for the South Island. This role included overseeing the South Island operations team who had to build a portfolio of 43 farms, and undertake significant deer and dairy development programmes. He reflects fondly on the team that worked together to transform the South Island operation and credits Ian Hercus, the South Island manager, for supporting his development.

During this period he was also on the Landcorp senior management group which met regularly in Wellington to discuss company problems and opportunities. Wayne thinks that many in the industry still under-rate the performance and contribution of Landcorp, probably because they understate their own successes. He is pleased that he has been able to continue to work with Landcorp, running two deer groups and one general discussion group, and has recently started working more closely on one farm with the manager and management team.

Establishing a consultancy

When Landcorp restructured in 2008 Wayne, his wife Sue with children Bridget and Jonathan, decided to remain in Canterbury rather than relocate to Wellington – there were unlikely to be earthquakes in the region. In what was a leap of faith, he decided to return to consulting and established Allan Agricultural Consulting Ltd. His only work was the promise of a single discussion group for Landcorp, and with few direct farmer contacts relied on referrals from a good network of other rural professionals acquired through the NZIPIM.

Wayne has slowly built up a base of clients and is grateful to those who supported him through the establishment period. He believes his corporate background, strategic and systems thinking provide a slightly different focus from many other consultants. He says his role is not necessarily to have all the answers, but to help farmers to implement ideas and technologies that fit their farm system and their aims and objectives.

Challenges for consultants

Wayne considers that the basic principles on all farms are the same but the technologies and management practices vary from farm-to-farm. This means that advice and discussions are tailored to their individual circumstances. There are a number of challenges facing agricultural consultants.

Succession

It is important to bridge the gap for new graduates between university and being an experienced consultant. It is a critical area which has been identified in the NZIPIM strategy. It is still very early days, but the NZIPIM is starting discussions about how to reduce the risk in the employment of new graduates for both the graduate and the employer.

This may involve graduates undertaking an internship position where they continue to have formal training, and project work, as well as work within a consulting firm. It is hoped that funding models can be developed to reduce risk in the process for the employee, and there may be external funding from industry or sponsors.

Industry demand for accountability

Currently there is little demand directly from farmers for accountability. However, industry is increasingly expecting to be assured of the credentials of the professional providing reports which pass over their desk. Wayne thinks that this will lead many to specialise as they are required to meet accreditation or other standards.

He also feels that there will continue to be the need for the generalist who can tie the whole system together. The whole system approach has been a strength of the industry and the NZIPIM has the challenge for both requirements.

Challenges for rural professionals

Professional development

The NZIPIM has been good at the technical development of members, but Wayne feels that the opportunities for professional development need to be increased for all rural professionals. The future of rural businesses rely on these professionals remaining relevant. To do this they need to keep up with new technical ideas and new business trends. He also thinks that we need to invest in the main resource of businesses, our staff, or in the case of an owner operation, ourselves.

Professionalism

Recently the NZIPIM has conducted two complaints

hearings, and in both cases the complaint was wholly or partially upheld. Wayne says these cases highlight the need to keep abreast of industry best practice. They also highlight the need for consultants and other professionals to be aware of their ethical and professional duties.

It is surprising how many people with high ethics have, in hindsight, misjudged a situation, or justified a position only to find themselves judged as unethical by others. There needs to be the opportunity to learn from discussions and robust debate within the branches about some of the ethical issues, such as professional duties, conduct and conflicts of interest.

Career progression

During his time with Landcorp, Wayne needed to consider the area of career progression for farm staff. He says that the progression for many professionals follows a similar path. First, they become proficient in individual technical areas, then in systems and financial management, before progressing to people management and leadership, and finally to governance.

Industry capability

The 1960s, 1970s and early 1980s saw a significant number of primary industry graduates. Since the mid-1980s the numbers of graduates declined to lows in the 1990s. It has only been in the last five to 10 years that we have seen any recovery in numbers but still well below the numbers of the 1960s and 1970s. As those graduating in the 1960s and 1970s retire over the next decade or so, a significant shortfall in rural professionals is expected.

Some of the gap Wayne expects will be taken by specialists who have resource management or financial background, but they may have limited understanding of farm systems. Some of the professions with low intake of graduates have relied on other professionals changing their focus mid-career, such as Wayne. With lower overall numbers of rural professionals, there is a smaller pool for these occupations to rely on. Supporting new graduates in all professions will view become increasingly important.

Being a rural professional

Wayne believes it is a good time to be a rural professional. Farmers faced with high debt levels, a changing regulatory and environmental landscape, and considerable opportunities for adopting new technologies as the Primary Growth Partnerships gain traction, all adds up to increased demand for the services of rural professionals.

There is a lot to keep abreast of, with the demand for more food with a lower environmental footprint, and all the problems that surround this. An important decision for some will be to generalise and concentrate on the whole system or to specialise and master a part of the system. Agriculture is far from a sunset industry, so it is up to us all to ensure that we have sufficient new graduates and levels of skill and professionalism to do the industry justice.



