A·D·I·C
Australian Dairy Industry Council Inc.

Dairy Australia
Your Levy at Work

Sustainable Farm Profitability 2015

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Dairy Australia was commissioned by the Australian Dairy Industry Council (ADIC) to prepare this report.

ADIC – The ADIC is the dairy industry's peak policy body coordinating industry policy. Comprising farmers (via Australian Dairy Farmers Ltd) and manufacturers (through the Australian Dairy Products Federation Inc.), the ADIC represents the whole industry on national and international issues. Visit www.australiandairyfarmers.com.au.

Dairy Australia – Dairy Australia is the national services body for dairy farmers and the industry. Our role is to help farmers adapt to a changing operating environment, and achieve a profitable, sustainable dairy industry. Visit www.dairyaustralia.com.au.

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Summary

Over the past decade, Australian dairy farms have faced many challenges to profitability. With the exception of Tasmania, the industry has failed to show signs of consistent growth. Despite the challenges, better performing dairy farms across all regions have continued to generate profits that have allowed wealth creation comparable to, or exceeding, other agricultural industries and investment categories.

The key outcomes from the 2014 Australian Dairy Farmers (ADF) National Dairy Farmers Summit, the Dairy Australia Strategic Plan and recommendations of the Horizon 2020[1] study all have a strong focus on the importance of farm profitability.

The 2014 Australian Dairy Industry Vision and Priorities document recognises that the industry needs to:

> continue working collectively to create a prosperous industry, including developing opportunities for wealth creation

> ensure that the principles of profitability are better understood, encouraged and put into practice, and that success stories are celebrated.

Australian dairy farming is conducted over a wide range of climatic zones: subtropical Queensland and Northern NSW; temperate, oceanic 'cold' Tasmania and Southern Victoria; and the inland rivers regions of Northern Victoria and southern/central NSW with a more continental weather pattern.

Overlaying these climatic zones are production systems ranging from predominantly (>85%) grazed pasture to full confinement/zero grazing systems. Furthermore, there are significant variations in milk processor pay structures and the seasonal price incentives.

As a result, there is no single silver bullet that ensures profitability. Sustaining farm profitability over the longer term may be challenging but achievable. Various industry data sets show that, when measured as Return on Assets (RoA), above-average levels of profitability can be achieved over a wide range of key physical output parameters such as production per cow and production per hectare. However, when we refer to specific areas of farm management or focus, one formula will not suit all.

For the purposes of this paper, the influences on farm profitability are divided into macro drivers, i.e. what is largely outside the farmer's control, and on-farm factors that are mostly under the individual farmer's influence.

Macro drivers that the farmer largely cannot control include:

> Weather – both prolonged events such as severe drought and extreme events such as flooding, cyclones, heat wave/bushfires.

> Milk and input price volatility – particularly post-2006.

> Finance costs and fluctuations in asset values.

> Government policy

  - Murray Darling basin water policy.

  - Carbon price.

> Economic shocks such as the impact of the GFC on farmgate milk prices and land values.

> Milk processors pricing structures and strategies.

> Retail milk price and discounting strategies.

This paper focuses on the tactical and strategic management decisions that farmers can make, including those made to minimise the negative impact of macro drivers:

> How well they farm, i.e. higher underlying profitability levels allow farm businesses to withstand factors outside their control.

> How well they deal with risk, i.e. risk mitigation strategies.

1 Horizon2020 – Future scenarios for the Australian Dairy Industry. Final Report to the Project Board from the Working Group, January 2013.

There is a consensus that sustainable profitability is key to a healthy and vibrant industry, but the Australian dairy industry lacks consistency in the use of terminology and metrics used to describe farm business performance.

The messages around how farms should be structured and managed to maintain and/or improve farm business performance often appear contradictory. That being said, sound farm business management advice from those with a proven track record in wealth creation (whether they be farmers or advisors) consistently advocates the following features:

- Operate at a high level of technical efficiency across most, if not all, aspects of the business, without necessarily being an exceptional/elite performer in any one particular area.
- Maintain a focus on optimal (rather than maximum) milk output, e.g. using supplements to maximise margins and overall returns rather than milk production per se.
- Complement the high level of technical efficiency with a strong understanding of business cost structures and cash flow.
- Maintain a strong focus on cost control across all aspects of the farm business, including both feed-related and non-feeding costs.
- Have an active approach to risk management to help minimise the impact of volatility.
- Maintain borrowings relative to cash profits at a level that allows for further investment and capital improvements.
- Apply sound investment strategies that avoid major expansion at the top of the price cycle.

In summary, to achieve consistently high results, farmers require a broad range of both farming and business management skills.

Introduction

Long-term, sustainable profitability is essential for vibrancy and growth in any sector or industry. This was reinforced at the 2014 ADF National Dairy Farmers Summit.

The three key activities identified at the Summit as crucial for farm business success were:

- Build one-on-one relationships and information, focusing on face-to-face contact through Regional Development Programs (RDPs), mentoring, milk companies, etc.
- Provide tools and knowledge to support risk management decisions, including through qualified advisors.
- Develop tools and approaches for benchmarking so farmers can compare their business to others and assess their own business year-on-year.

Over the past decade or more, under the combined challenges of the ongoing cost–price squeeze plus increasing volatility of milk prices, input costs and climatic extremes, many Australian dairy farmers have been questioning how they can sustain or improve profitability. These questions become even more pertinent under higher levels of debt servicing. In a sense, what farmers are asking is whether their investment decisions and operating tactics are creating an ongoing improvement in their net worth through a combination of net cash profit and capital gains (above inflation). As individual business operators and at an industry level, the question is "what are the variables that farmers and industry can best control?".

Despite these challenges, the dairy industry remains Australia's third-largest rural industry behind beef and wheat, with a farmgate production value approaching $4 billion. About 6,400 farmers produce nearly 9.2 billion litres of milk a year and the industry provides direct employment to about 43,000 people. Dairy ranks fourth in Australia's agricultural exports with a value of $3.21 billion in 2013/14.

Dairy market assessments indicate that the volume and value of global dairy product trade will continue to grow in the short, medium and long term, driven by increasing demand in developing dairy markets, including China, South-East Asia and the Middle East.

Despite the long-term positive market outlook, confidence among dairy farmers, while improving, remains variable between individuals and across regions. Confidence levels are quite fragile in that they are heavily influenced by the short-term impact of a rising or falling milk price rather than longer-term equity positions. In particular, farmers producing for the domestic market are less positive about the future and many are questioning the profitability of milk production. Equally, farmers who have experienced several tough seasons and reduced profitability are (in many cases understandably) focused on short-term issues rather than longer-term opportunities.

This discussion paper, produced by Dairy Australia in conjunction with the Australian Dairy Industry Council, focuses on on-farm profitability and will be relevant to all those in the Australian dairy industry with an interest in ensuring the profitability and resilience of Australian dairy farmers.

"Long-term profitability proved to be the key underlying theme throughout the Summit's discussions. There was a consistent message that the industry's priorities and actions should be focused towards delivering long-term profitability both on-farm and through the supply chain. The top three industry priorities articulated at the end of the Summit reflect this message calling for the industry to pursue a growth agenda through investment, innovation and advocacy."

Outcomes Report, ADF National Dairy Farmers Summit

What is profit?

Farm business performance has both cash and non-cash elements. A complete picture is not possible with one single measurement or parameter. Ultimately, it should be assessed in terms of cash, profit and wealth.

Economic definitions for profit are detailed below, but every individual farmer will have a different assessment of what is an acceptable level of 'profit' for their business and how that profit is described.

The terminology and metrics used to calculate farm profit are not consistent across the industry. For the purpose of this paper, the economic measures used are:

Operating Cash Surplus
Cash farm income less cash operating costs: herd, shed, feed and overheads. This is the amount of free cash generated by the farm operations that is available for debt servicing and lease payments, capital expenditure, owner drawings and tax. Cash operating costs are also referred to as farm working expenses.

Operating Profit
Calculated by taking the operating cash surplus and making the non-cash adjustments for:

- Imputed (unpaid) labour
- Depreciation
- Changes to inventory (livestock and feed reserves)

Operating Profit is also referred to as earnings before interest and tax (EBIT). Being a combination of cash and non-cash items and not including debt servicing, tax and capital expenditure, Operating Profit does not reflect the cash position of the business, but is essential for calculating growth in equity, return on capital and return on equity.

Net Farm Income
Is Operating Profit minus interest and lease costs and is the reward to the farmer's own capital. It is a measure of the profit that is available to pay tax while the balance is available for capital investments and/or loan principal repayments.

Cost of Production ($/kgMS)
Farm operating costs (variable plus overhead) divided by the total kilograms of milksolids produced.

Operating Profit Margin
Operating Profit expressed as a percentage of gross farm income. This is a measure of how efficient the manager is at turning farm income into profits that are kept in the business after all expenses are paid.

Return on Assets (RoA)
Operating Profit (or EBIT) divided by the value of total assets under management. RoA indicates the overall earning of the total farm assets irrespective of the capital structure (i.e. debt levels). RoA is calculated both including and excluding capital growth.

Return on Equity (RoE)
Operating Profit less interest and lease cost divided by total equity. RoE is a measure of the owner's rate of return on their own capital investment in the business.

Equity %
Total assets minus total liabilities. The ownership of total assets managed. Equity % is the most important measure of risk.

Growth in Equity (Wealth Creation)
Growth in equity is perhaps ultimately the best measure of profit as it encapsulates the impact of Operating Profit, Net farm income and capital growth in business assets.

Associate Professor Bill Malcolm[2] highlights that to fully assess performance it is important to assess the farm business from three perspectives:

Cash (Liquidity)
Is the business generating enough cash to pay the bills, repay the loans and reward me for the work?

Profit (Efficiency)
How efficiently are the resources I am using employed?

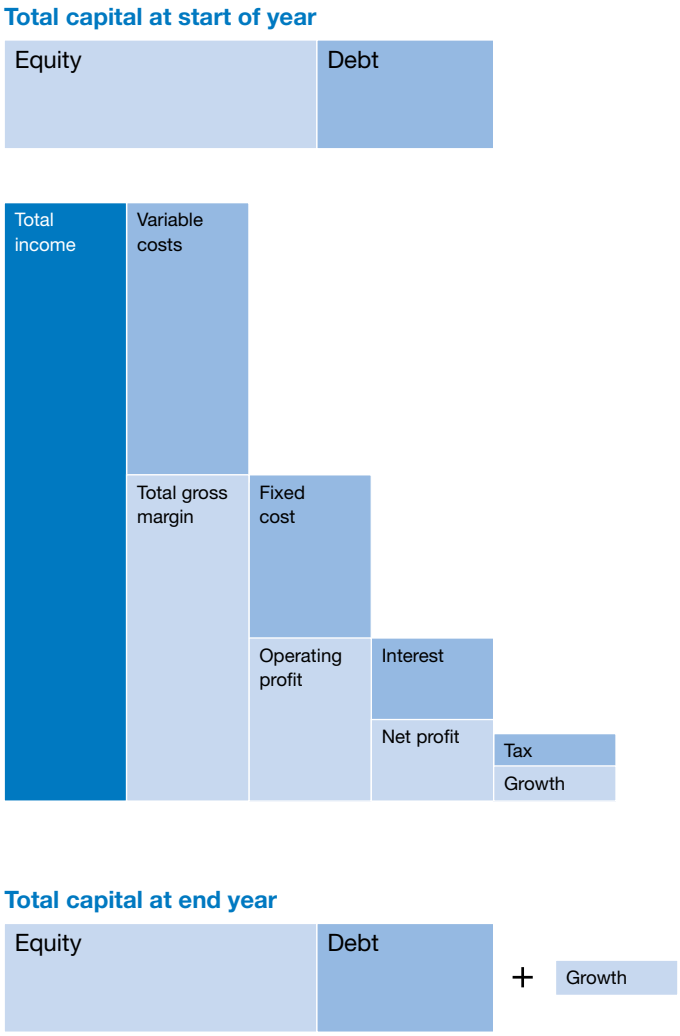
Wealth (Equity and Growth)
Do I own more than I did a year ago?

"These three measurements tell us about how well the business is contributing to meeting some important goals of farm families, such as building wealth, making best use of resources managed and paying the bills."
Associate Professor Bill Malcolm

> "Ultimately, profit should be assessed in terms of cash (liquidity), profit (efficiency), wealth (equity and growth)"
>
> Associate Professor Bill Malcolm

2 The Farming Game: Agribusiness Management and Marketing, by B. Malcolm, J. Makeham and V.Wright, Cambridge University Press, 2005.

Figure 1. The interconnection between cash, profit and wealth.



"There is no substitute for proper whole farm analysis of the choices the farmer faces: walk the farm, understand the human and technical and risk elements, work out the economic and financial performance of the whole farm business. This is done for the recent past as a basis for analysing how the farm business might perform in the relevant planning period, such as the next few years, with and without potential changes to the system."

Associate Professor Bill Malcolm

Profit results achieved

For any particular season, dairy farm profitability can vary greatly between regions according to the farmgate milk price, input prices and seasonal conditions. Furthermore, a wide range of farm business performance is seen within dairying regions, regardless of the underlying operating environment. In part, this is a result of individual farmers' ability and how they balance farm business performance against other lifestyle choices.

The Dairy Industry Farm Monitor Project (DIFMP) found that maximising profits was the main aim for more than two-thirds of the farms surveyed, although it did come with some caveats. A third of farmers said there must be a balance with lifestyle, 10% aimed to achieve profits sustainably so they are still farming in the future and 10% also said they aimed to increase net wealth.

For the third of farms whose main aim was not maximising profit, some of their other primary goals were balancing farming with lifestyle and the environment, taking time for holidays and 'loving the job'. In a sense, while the emphasis of farmers' focus on profitability will vary, they are all seeking to generate sufficient net cash profit to meet the needs of the business (operating costs and debt servicing) and lifestyle choices.

This is consistent with a study by Nuthall (2009)[3], who found that not all farmers agree that maximising profitability is the main goal of their farm business, although they see it as a way of generating money to support other goals.

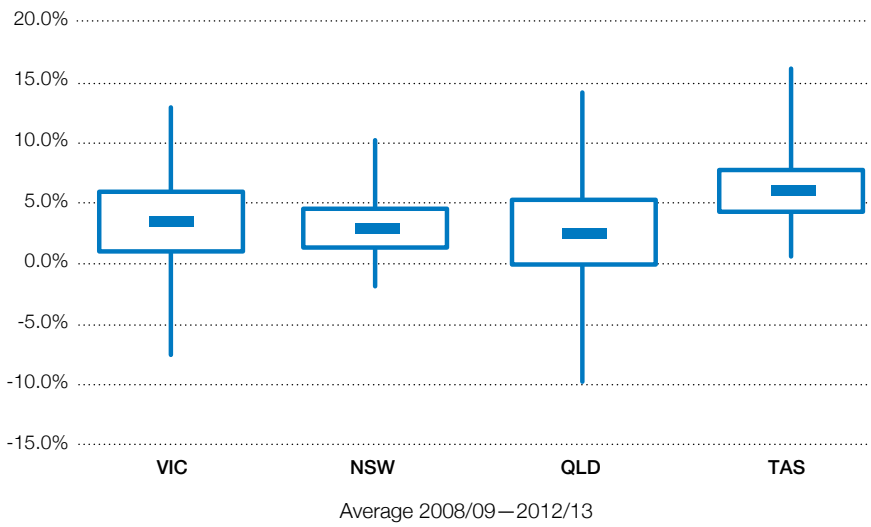
Regardless of the primary aim of the farmer, there is significant variation in profitability achieved by individual dairy farms within any one year.

Figure 2 shows the range of profitability (Return on Assets) being achieved across Victoria, NSW, Queensland and Tasmania when averaged across the five years from 2008/09 to 2012/13. While a wide and diverse range of production systems, climatic conditions and milk price exists between the regions, the average return on assets for this period is relatively similar. The other key observation is that within each region, there was a wide range of results (Figure 3). Over this five-year period, the average RoA in South West Victoria DIFMP data set ranged from 0.03 to 7.9%; within any particular year, RoA varied from -5.0% to close to 10%.

For example, Figure 4 illustrates the distribution of profit on Victorian and Tasmanian dairy farms participating in the DIFMP 2011/12. While the absolute values change considerably according to the region and the prevailing conditions (milk price, input prices, seasonal conditions), this type of spread of results is consistent across all years and all regions, highlighting the range of operational ability that exists in the dairy farming population.

Figure 4 highlights that, within a single year, the average profitability can vary significantly between regions despite little or no significant difference in underlying milk or input prices. The difference in RoA can be attributed to the underlying cost of production (as influenced by the seasonal conditions) and the variation in level of investment ($/kgMS) between the regions.

Figure 2. Return on assets 2008/09 to 2012/13 by state



3 Modelling the origins of managerial ability in agricultural production. Australian Journal of Agricultural Resource Economics 53, 413-436.

There is typically year-on-year variation. The South-West Victoria region example in Figure 3 highlights both the variation between years and the wide range of results observed within a year. Figure 4 and Figure 5 show that, despite similar milk and feed prices, the impact of regional seasonal conditions is considerable in terms of the cost of production and return on assets.

The enormous variation in profit performance across dairy farms in any one season is also seen in net farm income (i.e. operating profit less interest and lease payments).

Table 1 shows the variation between the highest and lowest profit performance during one individual year. To put this in context, the difference in performance if taken on an average farm for, say, Gippsland is the difference between a $265,000 loss and a $340,000 profit in the same year.

ABARES[4] analysis of 'high-performing farms' showed the enormous variation in farm performance over the 2007/08 to 2011/12 period. Table 2 shows the range for the three dairy farm performance categories, based on rate of return on total capital used.

The variation in farm profitability from year to year and region to region is largely influenced by milk price, input costs and seasonal conditions. However, within any annual set of data, there is always a wide range of results, reflecting the wide range of farmer skill sets and farmer focus when it comes to targeting farm business performance.

Figure 3. Return on assets 2008/09 to 2013/14 by in South-West Victoria

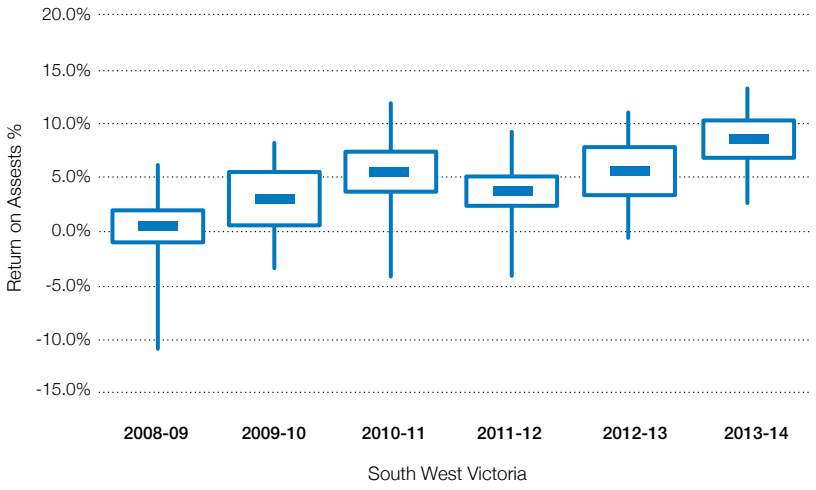


Figure 4. Return on assets 2011/12 in three Victorian districts and Tasmania

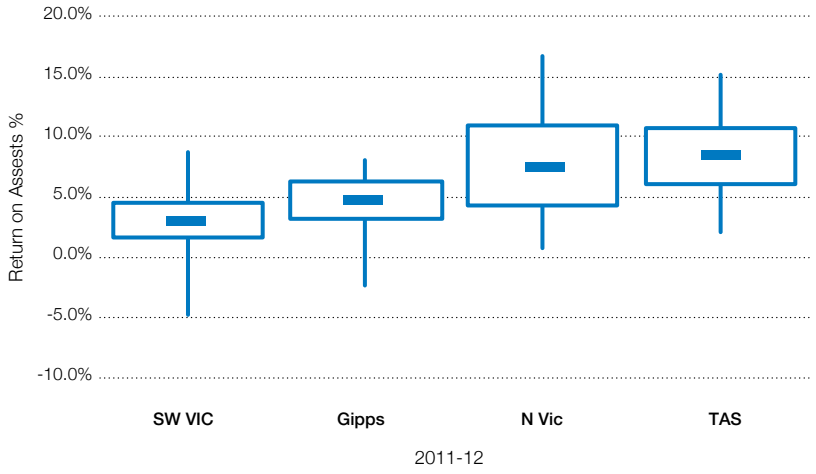
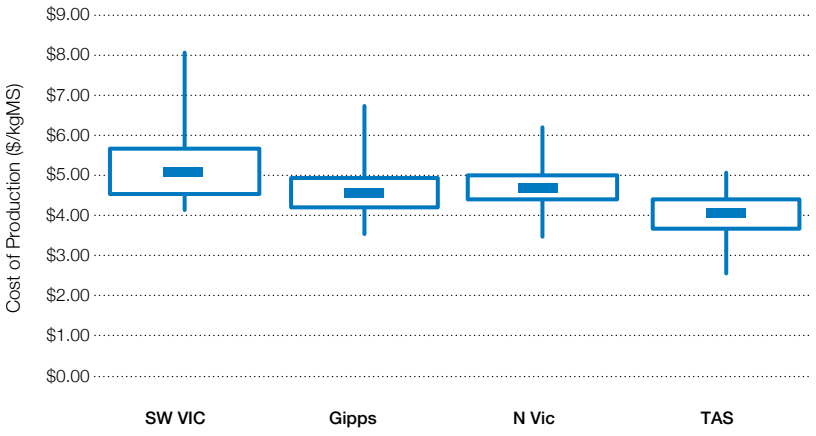


Figure 5: Cost of Production 2011/12 in three Victorian districts and Tasmania



4 Agricultural Commodities – vol 3 no 4 – December quarter 2013

Table 1. Profit variation in Net Farm Income ($/kg MS) 2011/12

Region	Average	Low	High
North NSW	$0.58	– $1.30	$1.99
South NSW	$0.92	– $0.58	$2.11
Northern Vic	$0.78	–$0.56	$2.39
South-West Vic	–$0.12	–$2.05	$1.79
Gippsland	$0.64	–$1.82	$2.33

Source: DIFMP 2011-12

Table 2. Variation in farm performance (average per farm) 2007/08 to 2011/12

Estimate	Top 25%	Middle 50%	Bottom 25%
Total farm cash receipts	$936,000	$647,000	$314,000
Farm cash income	$266,000	$114,000	–$4,000
Farm business debt	$936,000	$733,000	$390,000

Source: ABARES 2013

Table 3. Variation in Farm Profit 2010/11 to 2012/13

	2012/13		2011/12		2010-11	
	Top 25%	Average	Top 25%	Average	Top 25%	Average
Return on Assets Managed	4.8%	1.4%	5.4%	2.5%	n.a.	n.a.
Return on Assets Owned	5.7%	1.6%	6.4%	2.9%	5.4%	2.7%
Return on Equity	4.5%	–0.2%	5.6%	1.4%	4.6%	1.4%
Operating Profit Margin	21.7 ¢/L	7.7 c¢/Ll	26.6 ¢/L	14.1 ¢/L	27.7 ¢/L	14.1 ¢/L
Operating Profit per Cow	$832	$247	$1,065	$482	$940	$471

Source: ABARES 2013

Sustaining long-term profit under increasing volatility

Australian dairy farmers have long operated in a cost–price squeeze environment, however, it's now overlaid with increasing volatility. Maintaining high levels of profitability year on year has become more challenging. Despite these challenges, individual businesses are able to consistently perform at a higher level than their peers.

There is no question that Australian dairy farmers are facing an increasingly turbulent business environment. Figure 6 illustrates the enormous volatility in farm cash income and farm business profit experienced over the past 20 years.

This volatility in cash income and profit has been driven by climatic conditions (including significant droughts during 2002-06) and variability in both input costs and milk income over that time. There is strong evidence that farmgate milk prices post-2006 are substantially more volatile than pre-2006. This is unlikely to change.

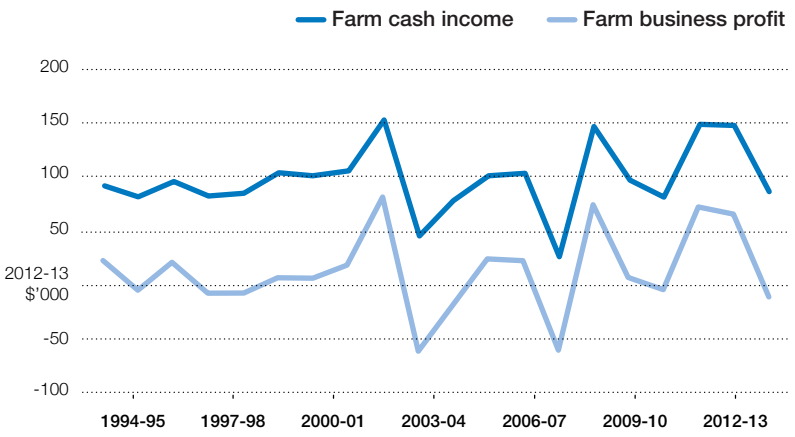
Furthermore, those who entered the industry or expanded in the period leading up to the global financial crisis (GFC) did so on the back of increased borrowings and/or lower equity levels than had been the case historically. The impact of operating environment volatility was amplified by higher debt servicing requirements.

The Rabobank Agriculture in Focus (2013)[5] report concludes that 'milk producers in New Zealand and Australia will need to structure their businesses and production systems to withstand ongoing high price volatility (for both outputs and inputs)'.

Several studies have illustrated the challenge of sustaining profit on an individual farm over the longer term.

The TasMilk60[6] project looked at the degree of consistency of profit outcomes achieved in 2006/07, 2007/08 and 2008/09, arguably one of the most volatile trade periods seen for many, many years, and in less-than-favourable climatic conditions.

Figure 6. Farm cash income and farm business profit



Source: ABARES

5 No Longer Low-Cost Milk Down Under

6 Performance, Profit and Risk in Pasture-based Dairy Feeding Systems – Findings from the TasMilk60 study

The project found that farm profitability was markedly inconsistent between years across the 56 farms studied for all three years. Almost two-thirds of the 56 farms were in the top tier of farm profitability (defined in this study as milk Earnings Before Interest Tax and Depreciation per cow) in at least one year during the study, but only 13% were consistently high (in the upper tier in all three years of the study) and only 11% were consistently low.

The Dairy Industry Farm Monitor Project (DIFMP) reinforced that consistently achieving above-average farm performance is difficult. During six years of the DIFMP, 82% of farms have either never appeared or appeared only once in the top 25% group (ranked by return on assets). This lack of consistency is not unusual; as farms move in and out of the top performing groups due to the operational environment factors such as specific location, feed reserves, irrigation reliability or a change in focus of the key operator(s).

The degree to which business performance is affected by factors such as seasonal conditions and the combination of prices paid and prices received in a particular year, is also a function of the type of farm system and how quickly, and to what degree, it can flex to best cope with challenging conditions and/or capture the upside of better operating conditions.

Studies such as TasMilk60 and DIFMP have highlighted a high level of year-on-year variation in relative business performance for the majority of farms surveyed. Conversely, they highlight that, regardless of the geographic region, the same 10–15% of the surveyed farms are able to maintain a level of profitability consistently in the Top 25% for their region. Furthermore, these high-performing farms maintain an operating margin that, in most cases, is above the operating margin of farms achieving average profits. This is shown in Figure 7, Figure 8 and Figure 9 where three farms consistently featuring in the Top 25% of profitability for their region of Victoria were selected out of the DIFMP data set. Their Operating Profit Margin ($/kgMS) was compared, between the farms and the average for the region. The comparison highlights that it is possible for individual farm businesses to consistently achieve Top 25% results and that they do so, at least in part, by maintaining a higher margin than the average, regardless of the prevailing conditions in their region.

Shadbolt (2013)[7] concluded that resilient farm businesses capture upside risk and mitigate downside risk. However, this research found that none of the farmers in the study group who best captured upside risk (when prices lifted from one year to the next) were in the group of those who best minimised downside risk (when prices dropped from one year to the next). This study showed that the majority of the more resilient farms were operating a System 3, as defined by DairyNZ's 1–5 scale. System 3 farms imported about 10-20% of their feed requirements and are considered to be middle ground. By not operating at the extremes, these farmers are better placed to flex their farming system according to the prevailing milk price, input cost and seasonal conditions. Furthermore, the level of resilience was, in part, due to individual farmers' attitude to risk and risk mitigation (which includes choosing to operate a moderate farming system).

The paper by Shadbolt 2013, TasMilk60 and DIFMP all illustrate the challenge of consistently maintaining profitability year-on-year. It is, however, apparent that there are combinations of key factors that enable businesses to consistently generate returns that are in the top 10–25%.

These factors are discussed in more detail in the following sections:

- Technical efficiency
- Cost control
- Management capability and tactical flexibility
- Farm financial management and investment decisions
- Farm system and size.

7 Resilience of New Zealand Dairy Farm Businesses

Figure 7. Operating profit 2006-07 to 2012-13 in Gippsland (per kg milksolids)

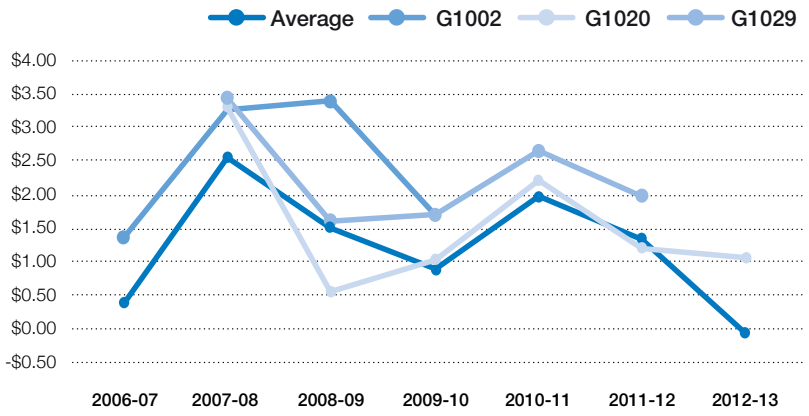


Figure 8. Operating profit 2006-07 to 2012-13 in South-West Victoria (per kg milksolids).=

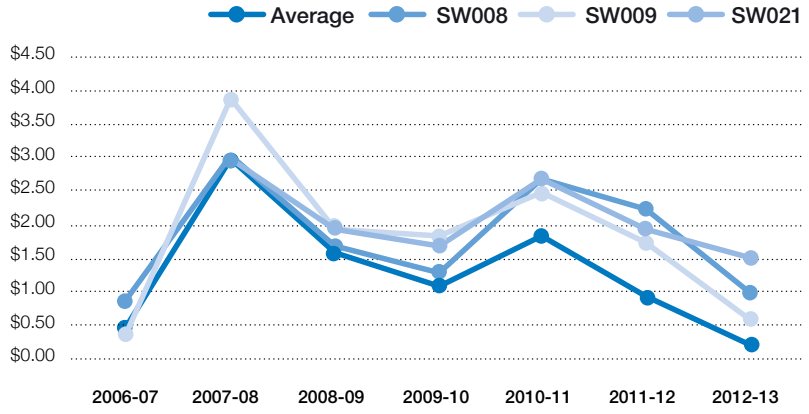
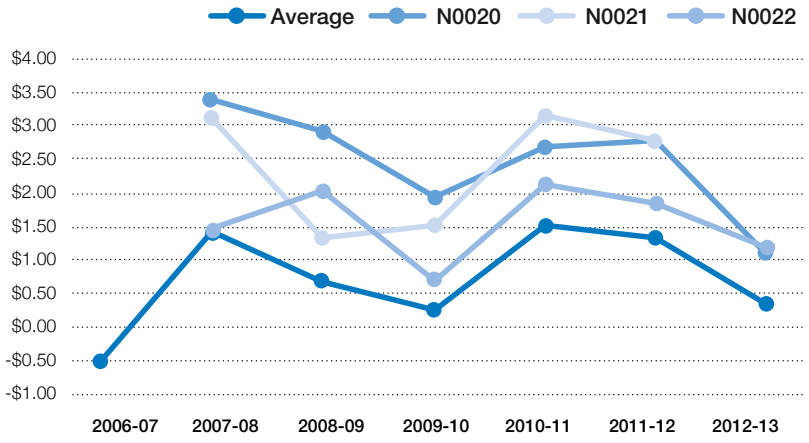


Figure 9: Operating profit 2006-07 to 2012-13 in Northern Victoria (per kg milksolids)



Source: DIFMP 2006/07 to 2012/13

Technical efficiency critical to profitability

High levels of farm profitability for Australian dairy farms are observed across a wide range of climatic zones and production systems. Various studies have shown that the consistently higher performing farms achieve their results through a combination of higher technical efficiency, effective cost control and tactical flexibility.

There have been numerous studies and analyses in Australia and internationally on the key drivers of profitable and resilient dairy farm systems. These studies include TasMilk60, the studies by Shadbolt (2013), Hauser & Lane (2012)[8], Dillon (2013), and Gilmore & Swann (2013)[9]. While the methodology and focus of these studies varied from analysis of existing industry-wide data sets to case studies of high-performing farms, famer surveys and targeted studies, the outcomes as they relate to farm business performance are consistent.

The factors contributing to high profit on individual farms are diverse and unique. Based on studies in Australia and around the world, the elements of resilient and sustainable pasture-based farm systems can be summarised as:

Technical efficiency

- Produce more milk per hectare from similar natural resources, i.e. climate and soil type
- Harvest more pasture per hectare from similar natural resources
- Produce more milk per cow for a similar production system, i.e. supplementary feeding levels
- Produce more milk per labour unit.

Effective cost control resulting in a low Cost of Production (rather than simply low cost).

Sufficient management capability and tactical flexibility to allow high levels of business performance to be maintained in an environment of volatility.

Farms that are profitable and resilient usually have high levels of technical efficiency, e.g. highly efficient utilisation of home-grown feed, high performance animals (high ABVs) and high levels of labour efficiency. However, a wide range of individual average technical measures – high to low – can be consistent with maximum profit.

Shadbolt concluded that those New Zealand dairy farms that were more resilient compared to those that were less resilient were more technically efficient, i.e. produced more milk (kg milksolids) per hectare and per labour unit.

These conclusions are echoed by findings in other dairy industries. For example, the key pillars of a resilient farm business identified in Ireland are the efficient utilisation of natural resources (grazed grass), a 'fit for purpose' animal (high Economic Breeding Index), strong business acumen in management, and a policy of continuous improvement of staff at all levels in the business (Dillon, 2013).

The messages conveyed in these studies are consistent with the message portrayed by two of the more influential farm business management consultants who have operated in the Australian dairy industry over the past 20+ years – David Beca and John Mulvany.

Through the analysis of farm data from across most of the dairying regions of New Zealand and Australia, Beca (2005)[10] concluded that the five Key Profit Drivers for pasture-based dairying are:

- Pasture consumed per hectare
- Milksolids produced per hectare
- Feed costs per tonne DM consumed
  - Concentrates
  - Fodder
- Labour efficiency
- Control of Core Costs (essentially non-feeding costs).

The consistent theme across all the dairying regions studied was that, in comparison to the Average Farm Benchmark, the Top 10% of business performance:

- Harvested more pasture per hectare
- Used the higher pasture harvest to underpin high production of milksolids per hectare
- Sourced purchased feeds that were cheaper per tonne of DM or per MJ through a combination of tactical buying decisions plus storage and feeding systems that minimised feed-out costs and wastage
- Achieved greater labour efficiency (cows milked per 50hr FTE)
- Spent less on non-direct feed items on both a per cow and per tonne dry matter (DM) of pasture harvested basis

8 Victorian dairy industry milk supply trends: Analysis of the drivers of farm profit (2012)

9 Perspectives and practices of profitable dairy farms: results from the Dairy Industry Farm Monitor Project 2006-07 to 2011-12

10 Key Profit Drivers – Separating the Best from the Rest (2005)

"Directly grazed pasture is always more efficient. When we have more high quality grazing available, the cows milk better and we do less work."

Dairy Farmer

John Mulvany[11] lists the following characteristics of a sound dairy business (based on his experience with southern grazing systems):

- Top 40% management skills
- Less than 40% imported feed (especially purchased)
- 3.0–4.0 tonne DM/cow home-grown milking area feed; no more than 25% of this conserved (hay/silage)
- Farm working expenses (excluding labour) at $3.00/kgMS
- Equity in total assets of 65% and no more than 20% of debt as short-term debt
- Debt servicing requirements (interest plus principal) less than $1.00/kgMS.

In summary, both Mulvany and Beca describe the key to farm profitability as being a combination of high physical output from the same inputs (technical efficiency) with a strong focus on cost control.

Gilmore and Swann examined the factors that enabled farms to sustain long-term profitability. It found that while not all dairy farmers primarily aimed to maximise profit, the majority said that controlling costs relative to income and a focus on home-grown pasture were key factors for a successful business. Management ability was also highlighted as a central factor in long-term profitability, as well as being a key strategy to manage risk.The analysis of two farms within the DIFMP (of differing size, system, location and constraints) highlighted consistently and repeatedly high-profit results.

Despite their significant differences, the two farms shared the following common aspects:

- A strong emphasis on home-grown pasture and feeding cows for profit, not production
- Ability to construct accurate and creditable budgets (feed/milk production and cashflow) to analyse changes to their farming system, manage downturns and inform both tactical and strategic decisions
- Managing risk by understanding their business, what its greatest threats are, knowing how to respond and taking action early.

In terms of their chosen production system, there is evidence to suggest that those farms that consistently generate Top 25% level profits design and operate high-performing middle ground systems (Australian Systems 2&3 and New Zealand Systems 3).

11 Business resilience – and what it takes to grow: NSW Dairy Symposium 2014

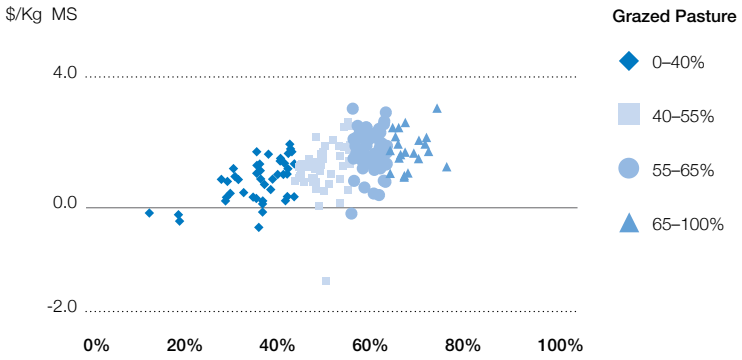
Efficient utilisation of home grown feed

A primary element of on-farm efficiency is pasture consumption. The TasMilk 60 project concluded that to remain profitable, all systems that include pasture must optimise not only the amount of pasture grown but the amount that is consumed. This study of Tasmanian dairy farms over three years found that pasture utilisation, core costs per cow and pasture quality were key profit drivers within the farmer's control.

The study by Hauser & Lane concluded that the most significant correlating factor with farm income, operating cost and capital investment was the proportion of directly grazed pasture in the diet (see Figure 10).

Hauser & Lane said the data showed that farms with less than 40% grazed pasture in the diet have a high risk exposure to milk price and feed price. It is more difficult to show a definite trend in risk or economic performance for farms with greater than 40% grazed pasture. As farms increase pasture consumption, climate risk becomes more significant. Pasture-based farmers have many options to mitigate this risk, including varying feed purchases, the use of fodder reserves, and an appropriate stocking rate.

Figure 10. Operating margin vs per cent of grazed pasture



Source: Hauser & Lane 2012

> "We have a strong focus on pastures, it is our cheapest feed. Supplements need to work for us and if it means that we consume less grass over the year then it's almost certainly the wrong decision."
>
> Dairy Farmer

High-performance animals

Highly profitable farms utilise high-performance animals. Improved genetic merit (ABV/APR) is positively correlated with profitability. Key findings of the Australian Dairy Herd Improvement Scheme (ADHIS) Feeding the Genes study (2013) were that daughters of sires of higher APR rankings:

- Were just as likely (if not more likely) to last in herds than cows with lower APR regardless of the feeding system
- Produced more milk than cows with a lower APR regardless of the feeding system, although the production response was greatest in the more intensive feeding systems.

The study also highlighted that the higher APR bulls do not necessarily cost more than bulls with a lower APR.

This is consistent with the study by Jonnson et al (2001)[12] that showed that cows of higher genetic merit versus lower genetic merit produced more milk when supplemented at pasture with low, medium and high levels of concentrate feeding. This study also showed that high genetic merit cows showed a decline in fertility rates when fed lower levels of concentrates.

Lacey & Coats in their 2013 report on the rationale for investment in herd improvement, estimated a significant gap between genetic gain achieved to date (at $9.50 per cow per annum) compared to the estimated gain available of $23.

High levels of labour efficiency

Over recent years, labour productivity on dairy farms, measured as the number of cows milked or kgMS produced per full-time equivalent (FTE) labour unit, has increased, on average.

In the TasMilk 60 study, lower labour and management costs per cow contributed to high profitability among consistent relative profitability farms due, in part, to more cows per FTE. There is a huge variation in labour efficiency on Australian dairy farms – from under 20,000 kg MS per FTE to over 100,000 kg MS per FTE. A comparison of cows per labour unit shows a variation from 40 to 190 cows per FTE.

Table 4. Estimated effects of cow's sire's Australian Profit Ranking on 305 milk production for lactations from Holstein-Friesian cows by feeding system adjusted for the cow's maternal grandsire's Australian Profit Ranking (95% confidence intervals)*

Milk production variable	Feeding system				
	Low bail	Mod-high bail	PMR	RHybrid	TMR
Milk volume (l)	**56.2** (40.9 to 71.5)	**68.0** (60.4 to 75.6)	**53.7** (39.8 to 67.7)	**79.7** (58.8 to 100.6)	**109.9** (75.1 to 144.8)
Fat yield (kg)	**2.6** (2.0 to 3.2)	**2.5** (2.2 to 2.8)	**1.5** (1.0 to 2.0)	**3.5** (2.7 to 4.3)	**5.7** (4.4 to 7.1)
Protein yield (kg)	**2.6** (2.1 to 3.1)	**3.4** (3.2 to 3.6)	**2.9** (2.5 to 3.4)	**4.0** (3.3 to 4.6)	**5.1** (4.0 to 6.2)

▲ ***The estimated effects of cow's sire's APR on 305-day milk production for lactations from Holstein cows by feeding system, adjusted for the cow's maternal grandsire's APR (95% confidence interval).*** *Coefficients represent estimated change in milk production variable per 50 unit increase in the cow's sire's Australian Profit Ranking; coefficients were adjusted for age at calving; herd and cow within herd were fitted as random effects*

"We're in the business of growing as much high quality grass as we can and converting it into milk. That's our core business, everything else we do has to fit in with that plan."

Dairy Farmer

12 Jonsson, N. N., Fulkerson, W. J., Pepper, P. M. and McGowan, M. R. (1999) Effect of genetic merit and concentrate

In New Zealand, from 1990 to 2009, the number of peak cows milked per FTE labour unit increased from 83 to 137, an increase of three cows per person per year[13]. By comparison, the average number of cows milked per FTE across Australia was 85 in 2011/12. The New Zealand data found that production system and herd size was not well correlated with cows per FTE.

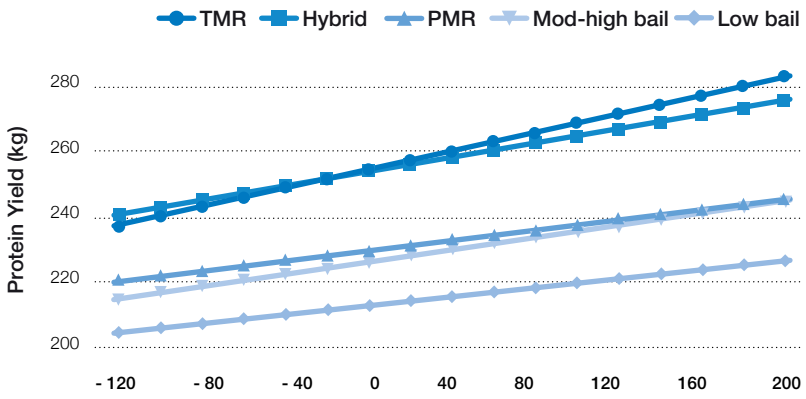
Improving labour productivity is vital to address rapidly rising labour costs and difficulties in accessing quality farm labour. Rabobank data suggests that the hourly rate for a farm assistant in Australia is more than double that in California. Given the pressures on labour costs and access in Australia, building or maintaining the Australian dairy industry's competitive edge requires increasing labour efficiency.

Defining the characteristic that determine higher levels of labour efficiency can be problematic due to the personal nature of what is involved in being well organised. In terms of farming systems and farm management, the following characteristics appear to be consistent with farms that have high labour efficiency:

- Appropriately sized milking facilities
- A strong focus on grazed pastures
- Simple and efficient supplementary feeding systems
- A stable work force that is well trained and supervised.

It is worth noting that the Hauser & Lane study highlighted that achieving higher levels of labour efficiency is more challenging for smaller farms, i.e. those producing less than 100,000-120,000 kgMS (700,000-800,000 litres) per year. This can be seen in the relationship between herd size and labour efficiency in Figure 12. Farm size as it relates to profit is discussed further in the 'Farm system, size and profit' Section.

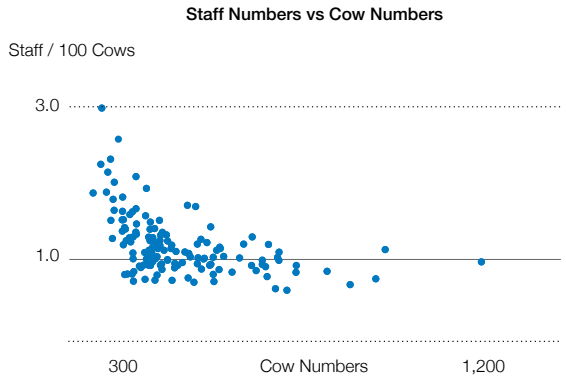
Figure 11. Daughters of higher APR sires achieve greater production of milk and components regardless of the feeding system used



▲ *Predicted 305 day protein yields by cow's sire's APR for lactations from Holstein cows by feeding system, adjusted for the cow's maternal grandsire's APR.*

Source: ADHIS Feeding the Genes study (2013)

Figure 12. The relationship between herd size and labour efficiency



Source: Hauser & Lane 2012

"Good genetics are important to us. For us, better cows not only produce more milk, they also have better confirmation, fertility and health traits. A balanced view is required to breed this type of cow"

Dairy Farmer

13 DairyNZ Economic Survey 2008-09

Management capability and tactical flexibility

Farmers who consistently achieve top quartile farm business performance understand their individual businesses and are on a pathway of continuous improvement. They are information seekers who engage with an active support network while not divesting themselves of managerial responsibilities. They have the ability to identify and use service providers, information and technologies in a way that is appropriate to their business and aligned with their business goals.

Farmers who have consistently higher profits tend not to be 'elite' performers for any particular determinants of profit. They do, however, tend to display a combination of above-average or better physical performance (technical efficiency) across most aspects of their business (i.e. milk production per cow, milk production per hectare, pasture harvest per hectare, cows per FTE labour unit) with a high degree of cost control. There are no areas of management where their performance would be considered below average. They are consistent all-rounders for the factors under their control and in their ability to manage uncertainty and risk.

This judgement from the TasMilk 60 project has been reinforced by numerous other studies. The Dairy Industry Farm Monitor Project feature article in 2013 concluded that consistently achieving high profits year-in-year-out does not require exceptionally high performance in any one partial efficiency measure; rather, it comes down to the manager's knowledge, skill and ability to repeatedly use resources in the most efficient way.

Business management skills – such as planning and goal setting, cash flow budgeting, risk management and investment decisions – are critical factors that determine profitability.

The approach recommended by the farm business management profession is to evaluate the overall farm business in terms of three aspects – profit (efficiency), cash (liquidity) and growth (wealth). To do this, a farm requires a balance sheet for the period in question, an annual budget and, preferably, a monthly cashflow budget. These tools help tell us how well the business is meeting the farmer's goals, making best use of the resources and paying the bills.

Anecdotally, it appears that less than 20% of farm businesses run a formal cashflow budget, while less than 5% regularly update actual against budget. Furthermore, within this subset a significant portion have not completed the cashflow voluntarily, i.e. it has been done at the request of their bank manager.

> "We always do a cash flow at the start of the year when we have an idea [of] the milk price. Yes, the budget will change during the year but at least we know what it's changing from."
>
> Dairy Farmer

Further anecdotal evidence suggests that the farmers generating Top 25% business performance are more likely to be utilising a cashflow budget that is updated at the start of each financial year, at least. There is some evidence to suggest that at some earlier stage in their farming careers, high-performing farmers have often been through a period where, through necessity (high debt and/or difficult operating conditions), they have closely monitored the cashflow of their business. While some of these high-performing farmers may no longer run an 'official' cashflow document, they have essentially committed their income and expenditure to memory. While this approach would not be considered best management practice (nor encouraged), it does highlight that some farmers can achieve consistently high business results and have an excellent understanding of their farm business without committing the process regularly to paper.

In their report to industry, the Horizon 2020 (Future scenarios for the Australian dairy industry) working group recommended the development of tools and decision support processes to improve focus on farm business performance and resilience over multi-year periods, as opposed to the current approach that focuses on single-year periods and/or isolated issues.

Whether or not their management systems are formalised or intuitive, higher-performing farmers tend to be 'information seekers'. Through their engagement with service providers and other farmers with a track record of understanding farm profitability, they maintain a support network of skilled and trusted advisors/information sources. They use and decipher this information as part of the continuous improvement principles applied across all or most of their business.

The long-term role of training and decision support tools in farm business management does not appear to be well understood. Over time, the farmer learns from the decision support tool and develops better intuitive decision-making skills – therefore making the decision support tool somewhat redundant. However, building farmer capability and decision-making ability without becoming reliant on decision support tools and processes and/or advisors should be viewed as a positive outcome. Identification of farm business management issues and developing skills and tools to help farmers make better decisions should be encouraged. Positive examples of capability building programs and associated decision support tools contributing to improved farm business management capabilities are detailed below.

> "We've been in a discussion group for more than 10 years now. Looking back, there haven't been too many meetings where we've not taken away one valuable piece of information or at the very least reconfirmed something important."
>
> Dairy Farmer

Dairy farmers surveyed in the 2013 Dairy Industry Farm Monitor Project rated management skill of the operator and the ability to make timely decisions as critical factors that contribute to long-term profitability. One farmer summed up that achieving long-term profitability is about "…doing everything well. The most profitable farms are not the best at anything, but are good at everything. They tend not to pursue a particular goal instead looking for a balanced approach."

Other less easily quantifiable profit drivers on dairy farms include developing management skills for correct timing of activities (fertiliser applications, pasture rotations, spring forage conservation) and to ensure high quality of purchased inputs (fodder and concentrates). Profitable farmers also closely monitor the financial outcomes of their management decisions and adjust them accordingly (McGrath 1997)[14]. This gives rise to the often quoted saying that: 'the difference between the top and average farmers is about two weeks'.

Support currently available

The Australian dairy industry is well serviced with education and training opportunities related to farm business management. Information and capability building programs are provided from a number of sources including the following:

Regional Development Programs

There are a number of Farm Business Management capacity building programs delivered via the Regional Development Programs (RDP). These tend to be developed and delivered on an as-needs basis as identified by the local RDP. This includes programs such as:

- **InCharge Financial Literacy**
  A short course aiming to equip existing farm business owners with a better understanding of the financial health of their business through better information collection and analysis.
- **Churn Milk Into Money**
  A two-day course aimed at equipping those looking to take the first step into farm business ownership with the necessary skills and insights to for sustained progression in the dairy industry.
- **Dairy Business Network discussion groups**
  Regular farmer meetings over a 2-3 year period where the primary focus is to build farm business management capacity and improve performance.

14 McGrath JM, 1997. Farming for high profit. Proceedings of the Ruakura Dairy Farmers' Conference 49: 20-28.

Dairy Australia

Dairy Australia partners with the Victorian Department of Environment and Primary Industries (DEPI) to deliver the Dairy Industry Farm Monitor Project (DIFMP). The DIFMP has been run for the past seven years to collect 75 full sets of physical and financial data across the dairying regions of Victoria. This data set provides valuable insights into farm business performance and via consistent collection and processing of data is in the process of being expanded to 300 sets of data covering all the major dairying regions of Australia. Similarly, for a number of years Dairy Australia has partnered with the Queensland Department of Agriculture, Fisheries and Forestry to conduct the Queensland Dairy Accounting Scheme (QDAS). As with many of these types of initiatives, participation in QDAS is voluntary and free of charge.

The other major Dairy Australia initiative (and perhaps the most important development in farm business management for the past decade) is the DairyBase project. Commencing in 2015, DairyBase will be an industry-wide database of high-quality data covering both physical and financial aspects of farm businesses. It is envisaged that DairyBase will be utilised across the industry to house farm data collected by industry programs such DIFMP and DBN groups as well as data from farmers and private service providers such as accountants, consultants and milk processor field services. DairyBase will be an invaluable resource for the Australian dairy industry that will allow for detailed analysis of all aspects of farm business management.

In the past, when farm profitability has been particularly challenged, Dairy Australia has responded by funding specific programs such as Taking Stock and Tactics for Tight Times. These 'response' type activities tend to be focused on surviving periods of extreme low profitability rather than building long-term farmer capability.

State Governments

The dairy divisions of state government bodies such as the Victorian Department of Primary Industries (DEPI), Tasmanian Institute of Agriculture (TIA), Queensland Department of Agriculture, Fisheries and Forestry (DAFFQ) and Department of Agriculture and Food Western Australia (DAFWA) are also active in delivering farm management training, often jointly funded by Dairy Australia. Programs such as Feeding Pastures for Profit, developed by DEPI, focus on improving pasture management and, by association, farm profit, primarily by better decisions around rotation length and pasture allocations. The Tasmanian Dairy Business of the Year awards, run by TIA (and its predecessors) for more than 20 years, focuses on objective measurement and judging of farm business performance. The awards showcase to industry how better farm business results are being achieved and is one of several TIA activities specifically relating to farm business management.

National Centre for Dairy Education

The National Centre for Dairy Education (NCDE), as part of the Diploma and Advanced Diploma programs, offers a number of course units focused on farm business management and farm systems analysis:

- **The Diploma of Agriculture** has been designed to provide the knowledge and skills required to undertake the farm production management role on a dairy farm. The program offers career opportunities in farm management, share farming and associated service industries.
- **The Advanced Diploma of Agriculture program** has been designed to enhance the knowledge and skills required to be a dairy farm business manager. The program offers career opportunities in farm management, farming and associated service industries.
- **The Advanced Diploma of Agribusiness Management** (Leadership Stream) is available to individuals who participate in the Developing Dairy Leaders Program.

In the past, the typical NCDE enrolee has tended to be those entering the dairy farm workforce rather than people established in their farming careers. The Certificate and Diploma programs cover most aspects of farm management including pasture management, agronomy, herd health, fertility, human resources and natural resource management.

Private advisors

Farm business management advice is also available in various forms from private consultants, milk processor field services, rural bank managers and accountants. Whether they have formal or more ad hoc relationships with service and information providers, the higher-performing farmers tend to be information seekers as part of their drive for continuous improvement. This includes deriving more value from the relationships they have with the likes of their bank manager and accountant. However, these better-performing farmers tend not to be over-reliant on service providers and do not divest themselves of the ultimate decision-making process. They have the ability to decipher information they gather and apply it in a manner that is more likely to improve their farm performance. They also have the ability to identify bad advice or advice that is inappropriate for their individual situation.

"When things get tough we draw on the people in our support team. It's important to communicate and draw on the experience of our accountant, bank manager, consultant, suppliers and other like-minded farmers. No matter how tough conditions get we always find we worry less when we have a plan in place."

Dairy Farmer

Cost control a driver of profit and resilience

Given the diverse nature of production systems in the Australian dairy industry, defining simple solutions to the farm profitability question is difficult. A high Cost of Production (Operating Costs divided by physical output) is a result of an imbalance between costs and output rather than these factors in isolation. Farm businesses with a low Cost of Production achieve this with efficient use of inputs to generate output.

When discussing cost control in a business, it is important to be clear that a low-cost system is not guaranteed to have a low cost of production. A low-cost system that results in lower levels of physical output can result in a higher Cost of Production (CoP) due to insufficient physical output. Cost control is achieved through effective management – ensuring all inputs are used efficiently in the production process and that investment is directed at improving production efficiency and reducing cost of production.

In their analysis of five years of results from entrants in the Tasmanian Dairy Business of the Year Awards, Rawnsley & Lane (2011)[15] concluded that increasing physical output alone was insufficient to provide a consistent improvement in business performance. Different combinations of pasture consumption per hectare, milk production per hectare and milk production per cow (the three physical outputs generally considered to be those most closely linked to profit) when sorted into nine groups in a 3x3 matrix of low, medium and high performance showed that no clear relationship with profit could be defined. This relationship is shown in Figure 13 and Figure 14.

However, as can be seen in Figure 15 and Figure 16, when pasture harvest and per hectare (at low, medium and high levels) were viewed in the same 3x3 matrix alongside CoP at low, medium and high levels, there was a clear relationship between a lower CoP and increasing levels of profit (RoA). The same relationship was observed when pasture harvest per hectare was replaced with milksolids per hectare.

Figure 13. Return on assets versus combinations (low, medium and high) pasture harvest per hectare and milksolids per hectare

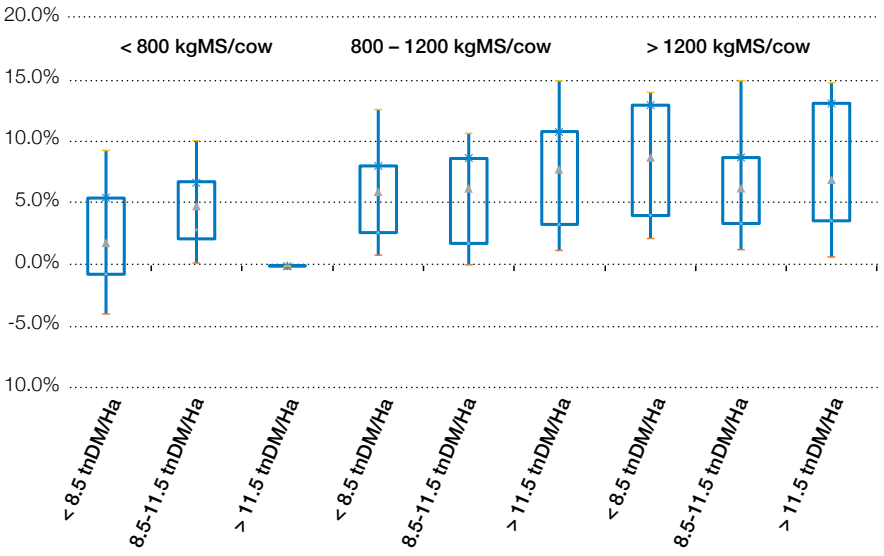
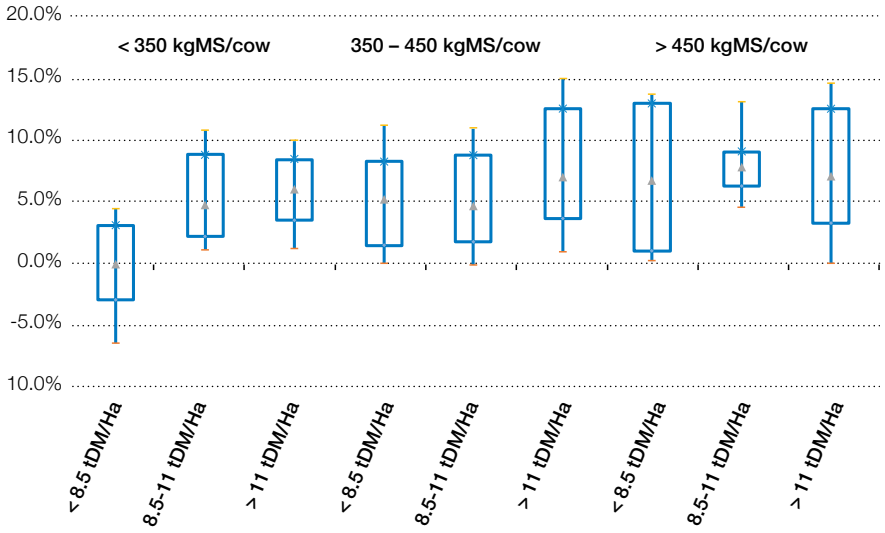


Figure 14. Return on assets versus combinations (low, medium and high) pasture harvest per hectare and milksolids per cow



Source: Rawnsley & Lane 2011

15 TIA DairySmart Farming Systems Seminars, December 2011

The Rawnsley & Lane study concluded that farms achieved their lower CoP by:

- harvesting more pasture per hectare
- producing more milk per hectare with a slightly higher stocking rate per hectare and a similar level of milk production per cow
- having a slightly higher portion of the cows' diet as home-grown pasture (measured as the % of Dry Matter Intake)
- operating with higher levels of labour efficiency
- spending less per cow on non-feed costs (e.g. herd health, overheads, shed costs)

Figure 15. Return on assets versus combinations (low, medium and high) milksolids per hectare and cost of production $/kgMS

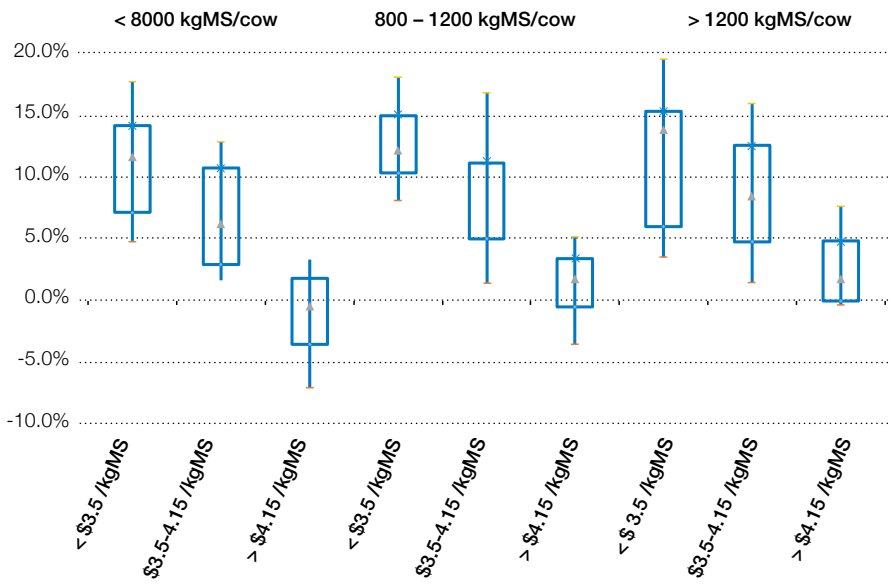
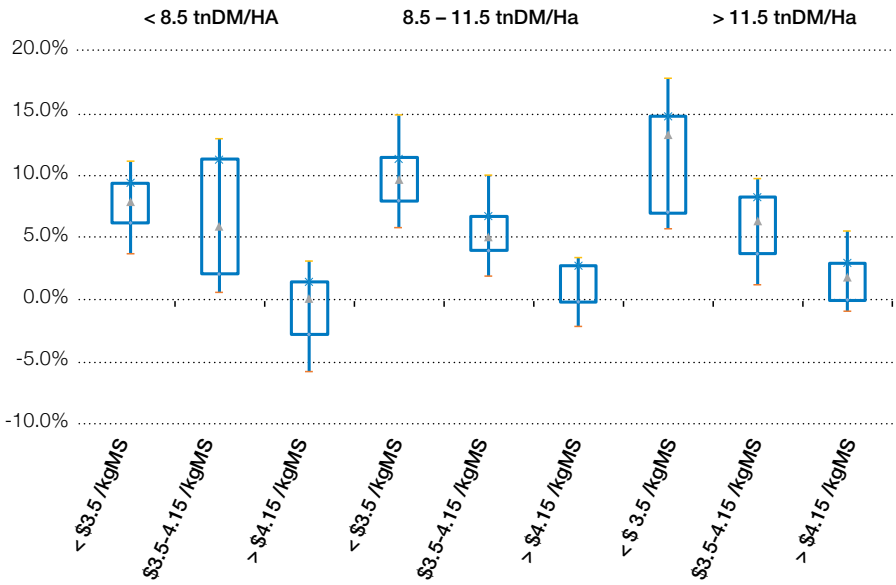


Figure 16. Return on assets versus combinations (low, medium and high) pasture harvest per hectare and cost of production $/kgMS



Source: Rawnsley & Lane 2011

"Early in our farming career we experienced some tough years. With the high debt we were carrying at the time we wouldn't have survived without a strict budget and a strong emphasis on cost control. These lessons have stayed with us throughout our time in farming."

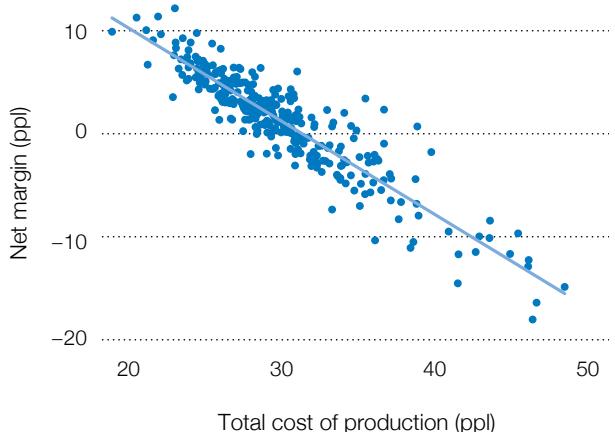
Dairy Farmer

The farmers involved in the 2013 Dairy Industry Farm Monitor Project were questioned on the critical factors that contribute to long-term profitability. Convincingly controlling costs, such as purchased feed, overheads and interest and lease costs, was the most critical factor (with 28% of responses); 26% of farms specifically stated that controlling costs relative to production was critical. Controlling costs was identified by double the number of farmers compared to the second most critical factor of milk price (14% of responses).

> "When we sat back and looked at our expenses it was amazing how extra costs had crept into our business over time. With a focus on cost control that's partly trial and error, we've been able to increase our margins and overall profit by identifying unnecessary expenditure."
>
> Dairy Farmer

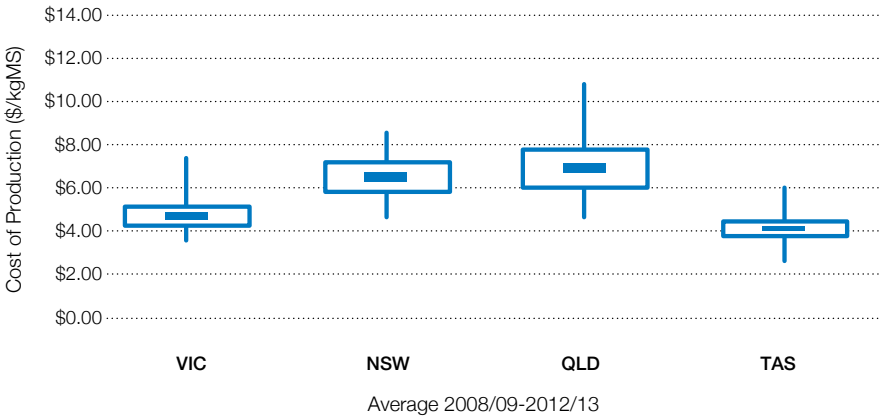
These farmer responses were echoed by analysis of MilkBench farm performance data in Britain in 2012 and 2013[16]. The summary from analysis of more than 300 dairy farms concluded that the key determinant of profit was total cost of production and that cost control through effective management was the key to improving net margin and ultimately profit (Refer to Figure 17). A similar relationship between Cost of Production and Profit was observed Rawnsley & Lane.

Figure 17. Net margin vs Total Cost of Production



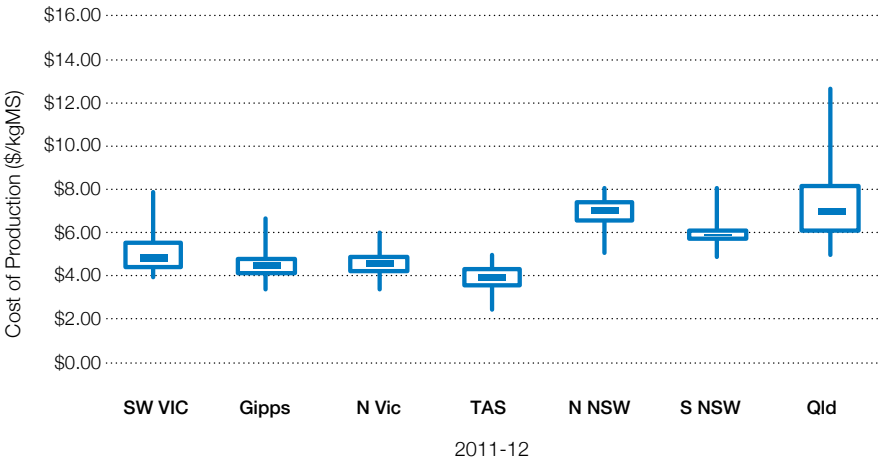
Source: DairyCo Milkbench & Managing Costs 2013

Figure 18. Total CoP, excluding lease and interest, average 2008/09 to 2012/13, by state



Source: DIFMP & QDAS & Tasmanian DBOY 2008/09 to 2012/13

Figure 19. Total CoP, excluding lease and interest, 2011/12 by region



Source: DIFMP & QDAS & Tasmanian DBOY 2008/09 to 2012/13

16 DairyCo Milkbench+ Managing Costs

The MilkBench report also concluded that four specific cost areas explained a minimum of 60% of the difference between the top and bottom 25% farms across three different enterprise types (cows at grass, composite and high-output cows). These factors were:

- Feed and forage variable cost
- Herd replacement cost
- Labour costs (paid and unpaid)
- Power and machinery costs

Cost control is a critical element of managing under volatility. The Rabobank Agriculture in Focus (2013)[17] report concluded that traditionally low-cost milk producers, such as Australia, have seen their production costs rise in recent years. These increases are both from factors on-farm (increased inputs, greater use of purchased or brought-in feeds, higher feed costs, interest costs, etc) and some other unique costs pressures (high wage rates and labour costs, rising energy costs).

This report concluded that milk producers in both New Zealand and Australia will need to structure their businesses and production systems to withstand ongoing high price volatility (for both outputs and inputs).

As with the variation in profit performance, the variation in production costs in any given season is huge, with a wide range within regions and within the same year. (Refer to Figure 18-19 and Table 5)

Cost structures are also highly varied between farm businesses. The cost structure ratio provides variable costs as a proportion of total costs. A lower ratio implies that overhead costs comprise a greater proportion of total costs that, in turn, indicates less flexibility in the business (Refer to Table 6).

The study by Hauser & Lane found that the percentage of grazed pasture in the cows' diet was strongly correlated with operating costs per kgMS produced. (Refer to Figure 20) Those farms that had a higher proportion of grazed pasture in the diet had lower operating costs compared to farms with a lower proportion of grazed pasture.

17 No Longer Low-Cost Milk Down Under

Table 5. Variation in production costs – total variable costs + total overhead costs ($/kg MS) 2011/12

Region	Average	Low	High
North NSW	$7.01	$5.14	$7.94
South NSW	$5.82	$4.35	$7.76
Northern Vic	$4.70	$3.48	$6.15
South-West Vic	$5.19	$4.10	$7.01
Gippsland	$4.60	$3.52	$5.76

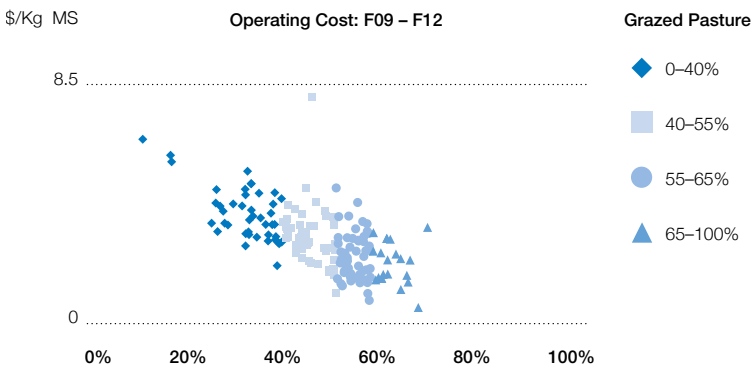
Source: DIFMP 2011–12

Table 6. Variation in cost structure (%) 2011/12

Region	Average	Low	High
North NSW	54%	44%	63%
South NSW	58%	46%	68%
Northern Vic	63%	47%	73%
South-West Vic	55%	40%	72%
Gippsland	57%	41%	72%

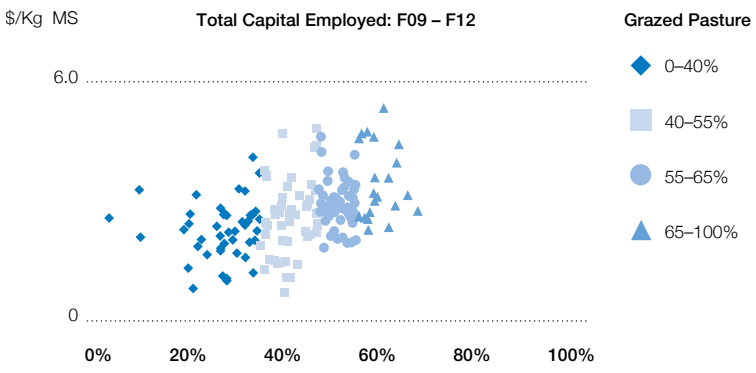
Source: DIFMP 2011–12

Figure 20. Operating Cost vs per cent of grazed pasture



Source: Hauser & Lane 2012

Figure 21. Total capital employed vs per cent of grazed pasture



Source: Hauser & Lane 2012

However, Hauser & Lane also showed that as feeding levels rose, the capital cost per kgMS produced trended downwards.

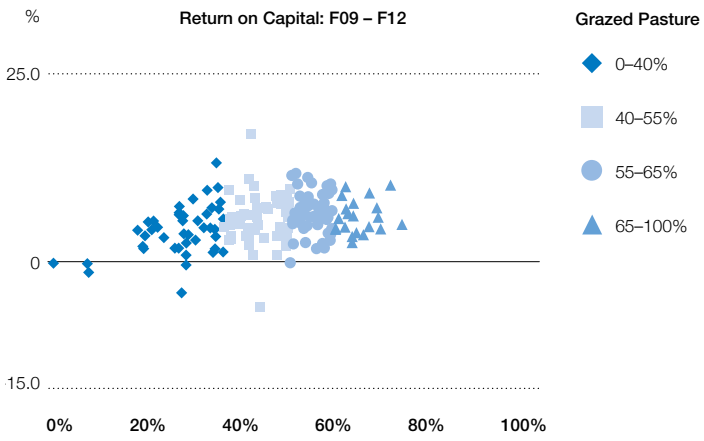
The combined result of these two competing forces is that similar levels of profitability are observed over a wide range of feeding systems. (Refer to Figure 21)

Figure 22 encapsulates the paradox of trying to define the more profitable farm systems and farming practices. In this study, where farming systems are defined by the percentage of grazed pasture, as the percentage of grazed pasture declines below 40%, maintaining high levels of profitability become more challenging. While the data is not conclusive, it also suggests that the same challenges are faced as percentage grazed pasture lifts above 80%.

In summary, the evidence is quite clear that the better dairy farming returns are equally likely to be achieved over quite a wide range of production systems with 40–80% grazed pasture.

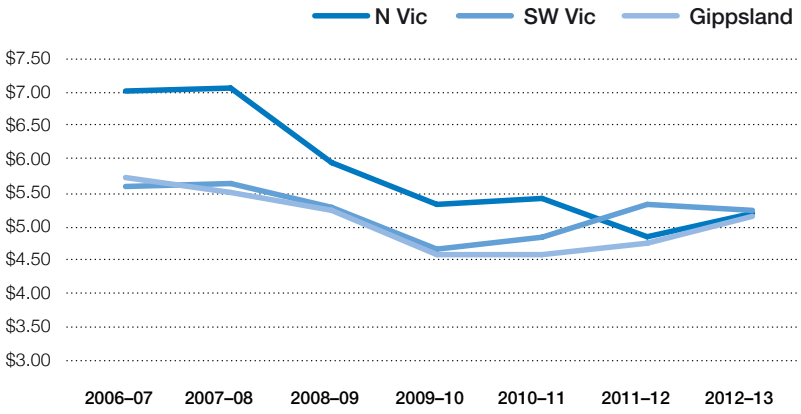
While costs on many individual dairy farms have continued to rise over recent years, average production costs in real terms have stabilised in Victorian regions, based on DIFMP data (real dollar values are the nominal values from each year converted to 2012/13 dollar equivalents to allow for inflation). The key message is that the major influences on the cost of production are the underlying seasonal conditions and cost of purchased feed inputs. This can be seen in Figure 23, where lower feed costs significantly reduced the cost of production across Victoria. While the same trend was observed in Northern Victoria, the returning availability of irrigation water was the major influence on cost of production.

Figure 22. Return on capital vs per cent of grazed pasture



Source: Hauser & Lane 2012

Figure 23. Production costs – total variable costs + total overhead costs ($/kg MS) 2006/07 to 2012/13



Source: DIFMP 2006/07 to 2012/13

"There's no doubt that increases in costs such as electricity, fertiliser and fuel continue to squeeze our margins ... but at the end of the day it's how well we use these inputs that is the major influence on our bottom line."

Dairy Farmer

Investment, debt and equity

The Australian dairy industry provides an opportunity for farmers to generate significant wealth. However, this requires a combination of technical and financial skills including the appropriate use of debt and the ability to avoid major investments at or close to the top of the price cycle. A healthy dose of persistence and patience is also important.

As an investment strategy, the returns from dairy farming (as with any other investment) are the combined results of operational returns (or dividends), internal growth and changes in capital values of purchased assets (ignoring the impact of inflation).

When viewed as a discreet single financial year period, the net cash profit is a measure of the amount of free cash available to reinvest. This calculation takes into consideration:

- owner-operator drawings
- tax
- additional capital purchases or improvements
- debt servicing.

If viewed from a longer-term perspective (>1 year), allowances should also be made for:

- depreciation (ongoing reinvestment required to maintain assets in a consistent working state)
- changes in inventory (mostly feed related)
- change in livestock numbers

A common observation is that while a farm may be generating impressive Operating Profits and Returns on Assets (RoA), there is oftern little (or insufficient) cash available to make principal repayments, build cash reserves or invest in other assets. This lack of liquidity can usually be explained through a more detailed examination of the factors listed above.

Conversely, farms that are generating low/modest RoA figures can often provide a more-than-adequate net cash return to the owners; especially when debt serving requirements are low.

Capital appreciation is the more difficult return to quantify, particularly over periods of less than 5-10 years. Being a 'thinly traded commodity', farms tend to be difficult to accurately value unless they are actually sold. In less buoyant times, this becomes further problematic as sellers tend only to meet a depressed market through necessity. The Victorian Farmland Values Index 2013, commissioned by Rural Finance, provides a detailed account of trends for farmland values in Victoria based on actual land sales over the past 30 years. While there have been variations between the dairying regions, the trend in dairy land values over the past 23 years can be summarised as:

1990-2000 Largely stagnant land prices where capitalised annual growth rates were no more than 2% per year.

2000-2008 Annualised capital growth rates of 10-12% (with the exception of the severely drought-affected Northern Victoria).

2008-2013 Post-GFC land prices, on average, declined and through the later part of this period showed annualised capital growth of less than 1%.

Over the longer term (20+ years), capital growth is likely to be a significant contributor to the growth in net worth of individual dairy farmers. However, over shorter periods, relying on capital growth is highly dependent on the timing of the major purchases and/or sales of farm assets.

In strict economic parlance, debt servicing is not a fixed operational cost of the business; for practical cash flow purposes it essentially is a fixed cost and, for business analysis purposes, is best expressed as a $/kgMS or cents/litre.

Economic theory suggests that fixed costs can be diluted through increased output and this holds true for debt servicing. However, if increasing total output of a pasture-based dairy farm is not coming from improved productivity from land or cows, then it is likely that, while debt servicing per kgMS is falling, it is more than being offset by an increased costs of production. The relationship between cost of capital per kgMS and cost of production per kgMS can be seen in Figure 20 taken from the Hauser & Lane study showing that as the percentage of directly grazed pasture in the diet decreases (i.e. the proportional amount of supplementary feed increases), cost of production per kgMS increases.

Farms operating with high levels of debt servicing can find themselves in a difficult position of trying to reduce debt servicing without increasing the CoP (expressed as $/kgMS). This will be problematic without high levels of farm business management capabilities across all aspects of the farm system.

While the level of debt servicing influences net cash returns, the amount of equity (Assets less Debt) held by a business is also the capital reserves the owner can draw on. Farms with high levels of equity can draw on these reserves to cover operating losses for significant periods. For farms with low levels of equity, this option may be limited or not available at all.

"We've expanded the business on a number of occasions over the years, but have always maintained our equity at around 50 per cent. We're always mindful that too much debt becomes a problem when conditions are tough and we don't want to rely just on capital growth."

Dairy Farmer

When viewed over long periods (20+ years), capital growth in farm assets over and above inflation is the norm. This is a reflection of the productivity gains made by the industry over time (i.e. more efficient use of assets). However, farmers' own capital valuations can become problematic, particularly where farm businesses have undergone major expansion and/or capital purchases at the top of the price cycle. If this is followed by a market correction, the farms with medium to lower levels of equity can find themselves in a position where they no longer have the reserves of capital to draw upon.

There is a wide range of equity positions across Australia, according to which data source is used. For example, in 2012/13, average equity levels for DIFMP participants were 55% for Northern Victoria, 59% in South-West Victoria and 67% in Gippsland. Based on ABARES data, real debt per farm increased by 9.0% per year from 2000/01 to 2009/10. This equates to an increase in real farm debt from $345,000 in 2000/01 to $747,000 in 2009/10. The breakdown is difficult to deduce without detailed analysis of the data sets, however it is likely that most of the increase in debt has been for expansion and growth. Accumulation of negative net cash profit is the other reason debt levels could have increased.

According to ABARES data, farm equity on dairy farms remains strong. At 30 June 2012, average equity ratio was 80%, with 60% of dairy farm businesses having an equity level above 80% and 28% below 70%.

Among the regions, dairy farms in Tasmania have the highest business debt – with debt at 30 June 2012 averaging $1.7 million per farm. Interestingly, rising debt levels in Tasmania have corresponded with a decade plus of consistent year-on-year growth in milk production.

Growth in average debt per farm has slowed in recent years, with more restricted access to credit from lending institutions, reduced demand for increases in debt and less growth in land values. The past 2–3 years appear to have been a period of consolidation for many dairy farm businesses with a focus on reducing debt. Under these conditions, it is not surprising that there has been little growth in milk production.

The 4–5 year period leading up to the GFC saw a rapid increase (in some cases up to a doubling) in land prices. This was not unique to dairy assets with many asset classes (agricultural and non-agricultural) undergoing similar increases. For the dairy industry asset prices were fuelled by:

- New Zealand dairy industry drawing on the balance sheet gains resulting from a sustained and unprecedented rise in New Zealand dairy assets to invest in the Australian dairy industry
- managed investment schemes investing in dairying regions
- corporate investment into dairy farms
- existing dairy businesses expanding

Post GFC, the non-traditional investors in Australian dairy assets withdrew from the market. With no alternative source of capital entering the market and the industry beset with challenging operating conditions, dairy asset values appear to have retreated or at best stagnated. In comparison to the peak of the price cycle for some regions, it appears that this contraction in the value of some dairy assets could be as high as 30–50%.

Hauser (2013)[18] highlighted that since the GFC there has been no capital growth and even some contraction in the capital value of Victorian dairy farm assets. This can be seen in Figure 24, which highlights that over the six-year period from 2006/07 the value of Victorian dairy farm assets has, at best, stagnated.

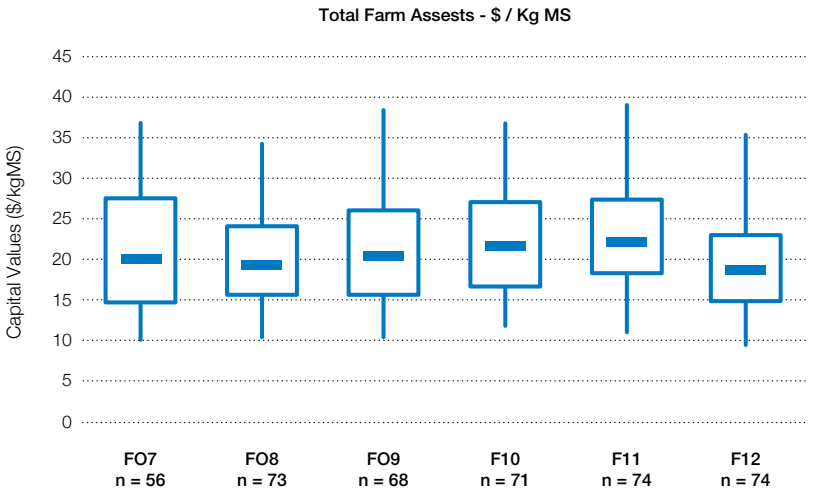
By comparison, land values in New Zealand over the past 20 years (other than for a 12–18 month period post GFC) have shown average annualised capital growth of 6–7%. Comparison with historical New Zealand land price trends would throw some doubts over whether the capital growth trend is sustainable, however, the New Zealand dairy industry continues to attract capital investment from across the wider New Zealand economy and overseas investors. Capital investment tends to attract further capital investment and, in the case of New Zealand, where dairy farming is the country's major industry, it sits at the forefront of the New Zealand psyche. The trend in New Zealand dairy asset values over the past 10 years is described in the DairyNZ Economic Survey 2012–13 and summarised in Figure 25. Anecdotal observation is that this trend in capital growth has accelerated once again from 2013/14 onwards.

18 'An overview of the current dairy farm economic environment and implications for lending and risk'

While New Zealand dairy assets continue to appreciate at their current rate, the net worth of New Zealand dairy farmers will continue to grow. It is worth noting that while New Zealand dairy farmers are considered on mass to be highly indebted, 80% of dairy debt in New Zealand is held by 20% of farmers. Those New Zealand farmers maintaining more moderate debt levels have seen significant increase in their balance sheet and, in the absence of industry-wide shocks such as Australia's prolonged 2000s drought, have continued to operate businesses with significant net cash profits.

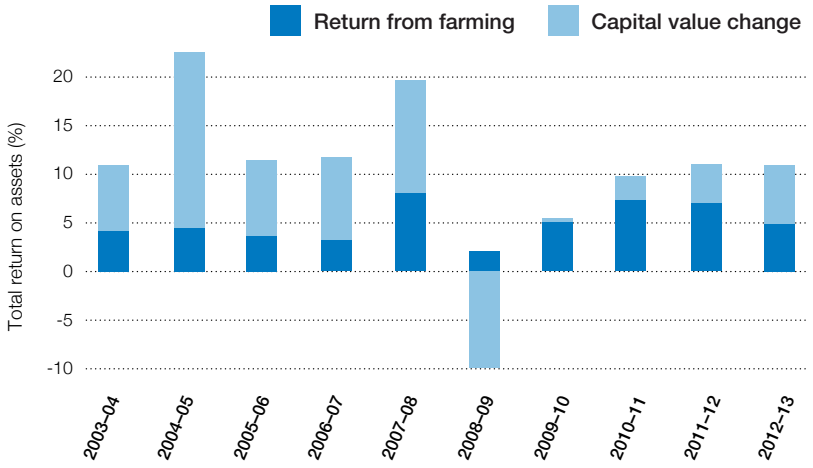
Historically, in Australia, a rise in farm debt has been mostly offset by increases in land values. However, under conditions of lower farm incomes and declining farm values, the proportion of farms in financial difficulties has risen. Farms with high total production costs and/or high levels of interest and rent payments per kilogram of milksolids are at more risk. The debt servicing ratio is defined as interest and lease costs as a percentage of gross farm income. Recent data shows a large variation in debt servicing ratios across farm business – from 0% (i.e. farms paying no interest or lease costs) up to 32% on some farms. When nearly one-third of gross income is spent on debt servicing, for example, in 2011/12 when gross farm income in South-West Victoria was $6.00/kgMS, $2.00/kgMS was going towards interest and lease costs.

Figure 24. Victorian farm asset values 2006/07 to 2011/12 based on DIFMP survey data



Source: Hauser 2013

Figure 25. New Zealand owner-operators total return on assets



Source: DairyNZ Economic Survey 2012-13

To use South-West Victorian DIFMP data as an example, the average CoP for 2008/09 – 2012/13 was $4.71/kgMS. (It should be noted that the CoP includes imputed management labour and depreciation. While these are essentially non-cash items, in most cases the owner-operator will be taking drawings from the business and the cash flow impact of depreciation will differ from the long-term average). Over the same period, the average farm income (milk income, livestock sales and other income) for the same South-West Victorian DIFMP farms was the equivalent of $5.80/kgMS. Theoretically, for this period, farms in South-West Victoria with a level of debt servicing greater than $1.10/kgMS had no net cash profit available for reinvestment.

As a minimum, dairy farmers should know their cost of production and their debt servicing (expressed as $/kgMS or cents/litre) relative to their average milk price.

What does all this mean for deciding whether an investment in dairy assets makes good economic sense? If we consider the following scenario:

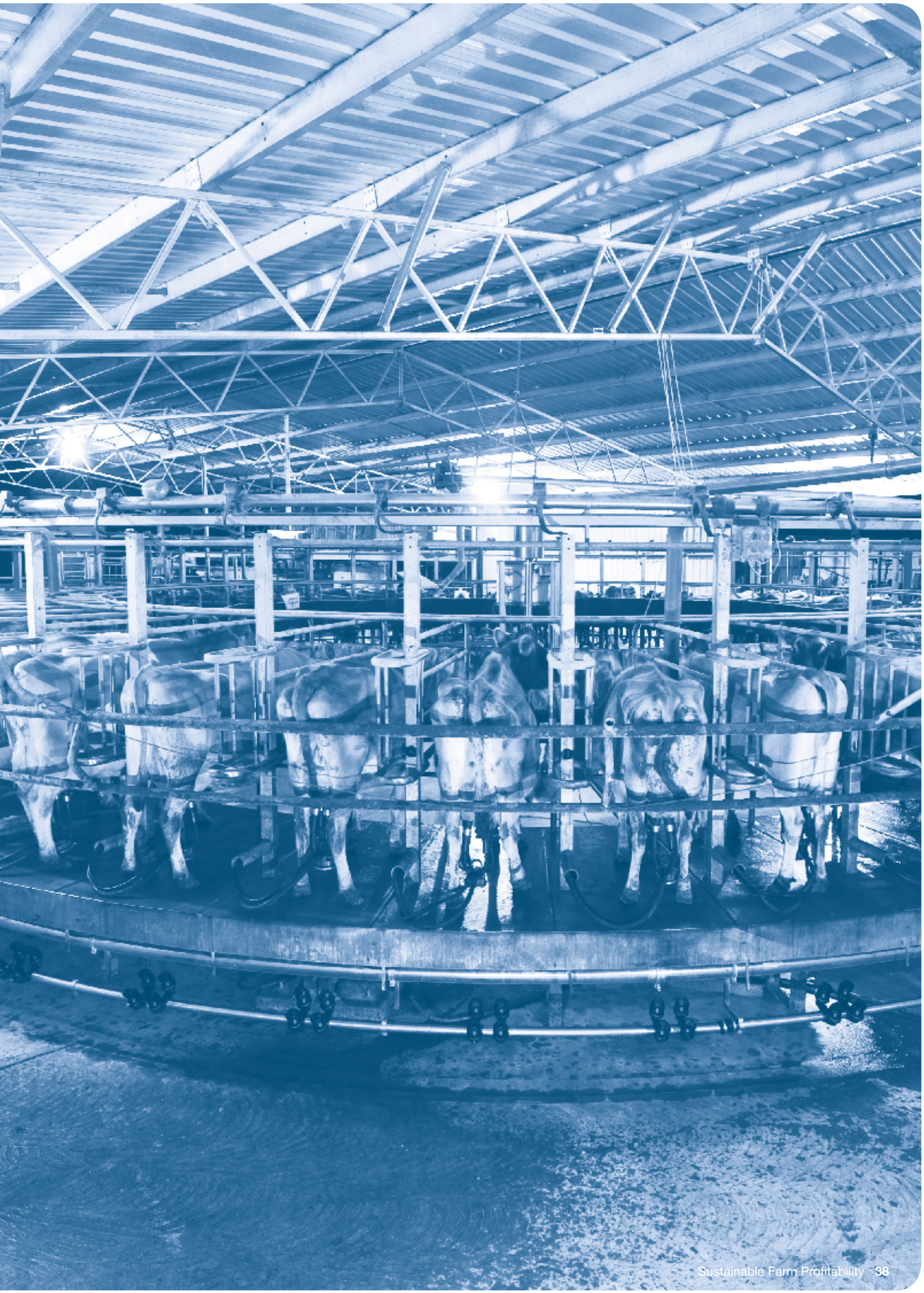
- Total Milk Production 150,000 kg/MS per annum
- Average farm income $5.80/kgMS
- Targeted Annual RoA of 5%
- Average CoP $4.80/kgMS
- Operating Margin $1.00

In this case if an average Operating Margin of $1.00/kgMS can be achieved and a Return on Assets of 5.0% is being targeted, then the amount invested should not exceed $20/kgMS or $3,000,000 in total.

Table 7. Summary of debt and equity indicators 2011–12

Region	Debt servicing ratio	Debt per cow	Equity percentage
North NSW	10%	$4,350	70%
South NSW	6%	$2,396	82%
Northern Vic	10%	$3,138	62%
South-West Vic	15%	$4,507	61%
Gippsland	11%	$3,159	72%
Queensland			82%

Source: ABARES



Farm system, size and profit

Dairy farms of all sizes and farm systems have the ability to be profitable (or unprofitable), although certain farming systems and farm sizes face particular challenges that result in them being under-represented in the top 25 per cent of farm business performance.

From 2005/06 to 20012/13, herd size on Australian dairy farms increased 21% from 213 to 258 cows. While farm size has an influence over income, costs and profitability, farms of all sizes have the ability to generate strong business returns and competent farm managers are already making this happen.

Farm size

In their 2012 study using five years of DIFMP data, Hauser & Lane defined small farms as those producing less than 120,000 kgMS/year and said these farms (on average) struggled to maintain Return on Assets (RoA) profitability levels that were comparable with larger farms. The study concluded that the major challenge to small farm profitably was the inability to dilute overhead costs, in particular labour costs and depreciation. Given that depreciation is a non-cash cost and the majority of labour on smaller farms is imputed, their impact on net cash profit is not always clearly apparent.

According to the overall results of the DIFMP analysis for 2006-07 to 2010-11, the larger farms (600+ cows) recorded the highest average RoA and highest average Return on Equity over that five-year period. These returns were produced primarily by the high gross farm income earned by extra-large farms. Total costs, including variable and overhead costs, for medium (250–400 cows), large (400-800 cows) and extra-large (800+ cows) farms were very similar over the period. While the data indicates that profitability increases with farm size (total milksolids production) the upwards trend is relatively flat once farm size exceeds 120,000 kgMS/per hectare. In terms of RoA, there isn't a compelling case for increasing herd/farm size beyond 250-400 cows relative to the 'basket of increasing risks and complexity' associated with increasing herd size.

Small farms, on average, had a lower gross farm income and received a lower milk price than all other farms. Most milk payment systems include productivity incentives that favour larger farms. The other factor identified by Hauser & Lane was that larger farms have responded more than small farms to processor price incentives to flatten their milk curves and produce a higher proportion of their milk during the higher payment months of the year. Variable costs on small farms were similar to those on farms of other sizes, however, overhead costs were much higher, caused mainly by higher imputed costs for labour and management and depreciation. As a result, total costs were higher.

Operating Profit (earnings before interest and tax) and Net Farm Income were similar for medium, large and extra-large farms, however, these farms were all higher than the levels recorded by small farms.

The results of the DIFMP report are echoed by additional analysis which found that small dairy farms had a significantly higher cost of production than their medium to large peers. Labour costs appear to be the main driver of this effect.

Table 8. Summary of the financial performance of small, medium and large farms participating in the Victorian DIFMP

	Small	Medium	Large
$/Kg MS	<120,000	120,000–240,000	>240,000
Number of farms	27	35	12
Average no. cows	180	310	730
Kg Milk solids	84,000	162,000	380,000
Milk income	5.28	5.57	5.90
Other income	0.45	0.41	0.47
Total income	**5.74**	**5.98**	**6.37**
Variable cost	2.33	2.39	2.74
Fixed cost	2.91	2.30	2.22
Operating cost	**5.23**	**4.69**	**4.96**
Operating margin	**0.50**	**1.29**	**1.41**
Lease cost	0.11	0.15	0.12
Interest cost	0.56	0.57	0.66
Net farm income	**–0.17**	**0.57**	**0.63**
Total capital employed	29.50	23.55	22.86
Owner non-financial assets	24.31	19.52	19.26
Owner equity	17.06	12.68	10.84
Return on capital	1.7%	5.5%	6.2%
Return on assets	1.6%	5.9%	6.7%
Return on equity	-1.0%	4.5%	5.8%
Leased assets (% Total capital)	18%	17%	16%
Owner equity (% Owner capital)	70%	65%	56%

Source: Hauser & Lane 2012

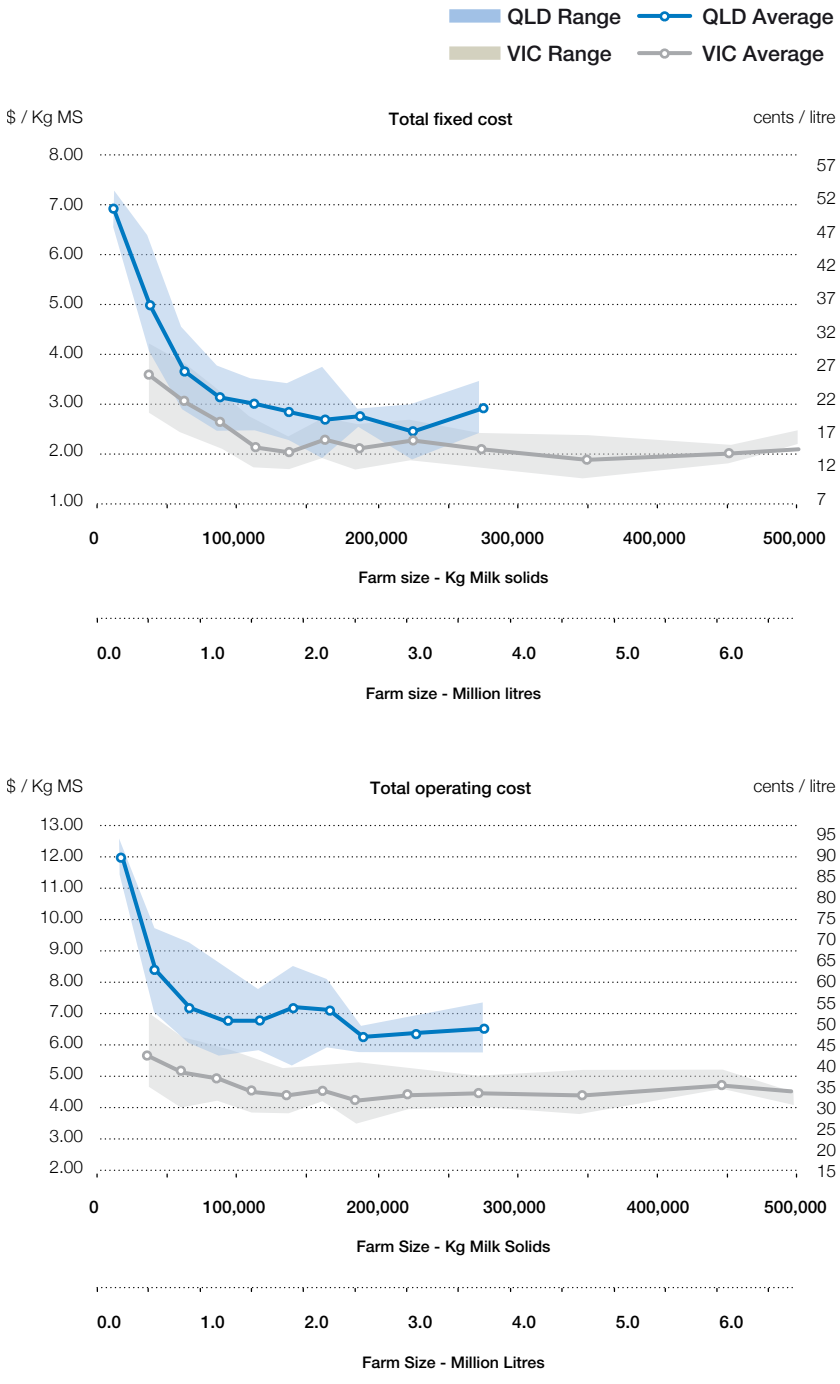
Farm systems

Production system is not a good indicator of profitability; a farm can be profitable or unprofitable operating any production system.

New Zealand analysis found that the top 20% of farms based on both operating profit per hectare and operating expenses per kilogram milksolids showed no difference in the mix of farms systems when compared to the total population.

Examples of reasonable investment returns can be found in all farm systems in most years, however, data in the Hauser & Lane report showed that capital return on farms with highly intensive feed systems was extremely sensitive to milk price and feed price. This was a consequence of their very low operating margins. When the milk price is high and feed price low, these farms can generate a very good capital return. Similarly, farms with a high reliance on grazed pasture are highly sensitive to periods of poor pasture growth.

Figure 26. Comparison of total fixed costs and total operating costs versus farm size for Victorian and Queensland data

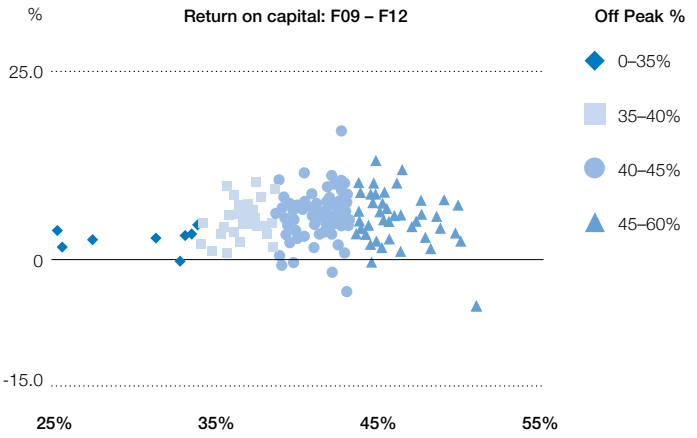


Source: Hauser 2013

Hauser & Lane also concluded that calving patterns and the 'shape' of milk supply curves did not have a significant impact on farm profitability as average milk price and cost of production tended to move proportionally in the same direction as milk curves move from being seasonal to flatter (or vice versa). The effect of seasonality of milk supply on farm business performance can be seen in Figure 27.

Dairy farming systems need to be resilient to external forces and have the tactical flexibility to overcome unanticipated events that can lower profitability. Shadbolt found that the ability to flex with the season resulted in consistently better performance. This flexibility resulted in the more resilient farms in New Zealand being more likely to operate a system 3 farm (i.e. 10-20% of total feed imported, both as supplements to extend lactation [typically autumn feed] and grazing and supplements for dry cows).

Figure 27. Return on capital of Victorian dairy farms versus off peak milk per cent (milksolids produced Jan-June as a % of total milksolids production



Source: Hauser & Lane 2012

Conclusions

Sustaining profitability, in both good times and bad, is a challenge for many individual dairy businesses. This is clear from the significant variation in profit performance across farms in any given season or region. However, there is clear evidence that there are key areas that can improve or safeguard farm business profitability.

- Farm systems are unique and all farmers have a different perspective on their goals and what is a satisfactory level of profitability.
- For any farming business, generating profit is always balanced against other lifestyle choices. The degree to which profitability is a priority varies significantly between farmers.
- The standard economic measures for profit and risk are relevant to the dairy industry and when used in concert provide a complete picture of farm business performance.
- There is no silver bullet which ensures profitability and one size doesn't fit all dairy farmers. But there are areas of focus that can help all farmers achieve higher levels of profit. These fall under the broad categories of efficient use of inputs, a strong emphasis on cost control, and a sound management skillset.
- While industry has clear responsibilities for promoting and encouraging profitable farming practices, ultimately, individual farmers must take responsibility for the profitability of their own businesses.
- Farm profitability is affected by factors (macro drivers) outside the control of most farmers, although the degree of risk mitigation strategies and therefore impact on farm business performance varies greatly. The Australian dairy industry doesn't have access to, or embrace the range of, risk management options available to other sectors.
- The past 12 years has been a period of significant volatility within the macro profit drivers. This appears to have a major influence on farmer confidence and their willingness to invest further in the dairy industry.
- Higher levels of farm profitability are generated when farmers are consistently good across most aspects of their business rather than being elite performers in one area of farm management and below average in others.
- Profitability (RoA) of smaller farms (<120,000 kgMS) is challenged by high overhead costs, mostly imputed labour and depreciation. While larger farms appear to have higher levels of profitability, for farms above 120,000 kgMS the advantage is not significant.

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