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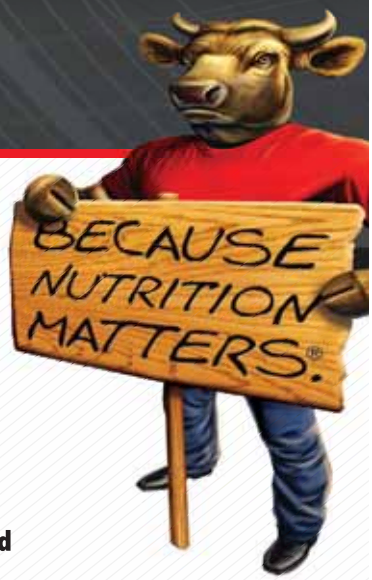

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CONTENTS

NEWS

Brave new corporate world of dairy 15
Frustration grows over proposed SW dairy buyouts 15
Dairy's cream combines 17
First piece in the puzzle for dairy empire 17
UDV agrees to get on front foot 23
Seeking answers to engaging activists 24
Dairy processors reject GM pastures 26
NZ study tour shares insights 27
Aus dairy stable amid global volatility 28
A tale of two markets 29
Input costs key risk factor 31

ON FARM

Nitrogen mindset must change 34

ATTRACTING AND DEVELOPING PEOPLE

Cows create ag careers 21
Scholarship lands jobs for young guns 22

PROMOTING & PROTECTING DAIRY

Supporting young leaders in agriculture 36
Developing trade in Middle East 37
Promoting dairy products and industry in a fun way 39
Science shows more dairy needed 40

DAIRY FARM BUSINESS MANAGEMENT

Winning way on three farms 46
A journey of business growth 50
Sharefarming creates win:win situation 56
Good business becomes great business 58
New insights in categorising cows 62
Improving the business value 68
Getting investment ready 69
Let's talk about debt 70

HAY AND SILAGE

Dairy industry's unsung silage guru 74
Hay: the good, the bad and the mouldy 76
The full story about mouldy hay 78
Maintaining silage quality at feed out 81
Tips for buying silage inoculants 84
Wrapped silage bales advances 88
Preserving silage protein content 91
Hay balers: a hidden fire danger 93

INCREASING FARM PROFITABILITY

DairyBase open for business 101
Taking control of their farming future 102
Dehorning calves humanely 104

COLUMNS

At my desk 5
Milk Matters 6
Dairy Australia Roundup 11
NHIA News Roundup 18
Update from the Gardiner Foundation 32
Australian dairy market 44
International dairy market 45
What's On 97
Think Again — the Ryan Report 98
Snippets and Titbits 99
ADHIS 100
Regional Development Programs/ Extension co-ordinators 106

OUR COVER

DAIRYBASE is going to create more opportunities to improve profitability on dairy farms, according to Victorian dairyfarmers Simon and Lauren Finger. See story pagae 103.

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A new kind of customer

THERE'S a lot of talk these days about the dairy industry meeting the needs of its customers. The conversation is often around some of the social licence hot topics — animal welfare, food safety and environmental sustainability.

But the challenge for the industry is that "the customer" is becoming increasingly difficult to define.

I was at an event a couple of months ago where a person from Coles identified the top five things it said its customers were concerned about including that animal welfare was rocketing up the list. Interestingly the list didn't include price.

When this was pointed out, the person said cheap prices were a given; they transcended every other concern.

For the farmers in the audience it was frustrating to be told that customers had a list of requirements that farmers saw adding to their bottom-line costs but that the those same customers wanted cheap prices as well.

'With information and social media tools available to customers, we are seeing the emergence of the power of the individual customer.'

I think what it really reflects is the true challenge for farmers, processors and supermarkets: that the market is becoming increasingly segmented.

So there is a group of customers for which price is the main concern, while there is another group for which animal welfare is paramount and another group for which environmental sustainability tops the list.

With information and social media tools available to customers, we are seeing the emergence of the power of the individual customer.

And therein lies the rub for dairy.

As Dr Peter Stahle, from the Australian Dairy Products Federation, told the United Dairyfarmers of Victoria conference, coexistence and segregation were major challenges for dairy's use of genetic-modified technology. Dairy, like many other commodities, relies on bulk aggregation of products collected from many farm suppliers by a limited number of processing manufacturers, he said.

The products from these manufacturers are being increasingly directed through a number of customer channels. But the milk for those products is coming from the same farms. So by-and-large a customer who wants the cheapest price possible could be getting the same milk as someone who demands the highest environmental standards (and who may well be prepared to pay a premium for that). This has created opportunities for small-scale processing but that's not a feasible solution for the vast majority of farmers who supply the big manufacturers.

Part of the answer lies in things like the Australian Dairy Industry Sustainability Framework that allows the industry as a whole to show its credentials, so that those big pools of milk can be described as meeting a certain standard.

The other interesting thing about the change to a segmented market is how our industry overall is well-placed to take advantage of this. For example, Australian manufacturers have always had a more diverse product mix than New Zealand.

In a world where each customer wants something different, an industry that has the flexibility to meet these different demands is better positioned to ride out the highs and lows of global prices, which are largely based on the bulk commodity markets.

It's going to be an interesting space to watch in the next 5-10 years. D

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The Australian Dairyfarmer

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Stocktake essential for good outcomes

By **Noel Campbell, ADF president**

Key points

- ✔ Report provides resource for farmers to run successful business
- ✔ Advocating for improvements to 457 visa process
- ✔ Developing policy on unconventional gas mining

WHETHER at the farmgate or in the board room, stopping to take stock, acknowledge success and identify areas for improvement is essential to ensuring any good business remains on track to deliver desired outcomes.

Now just past the half-way mark for 2015, Australian Dairy Farmers (ADF) is reflecting on the progress made thus far and the challenges yet to overcome, with the interests of dairyfarmers and their profitability top of mind.

Improving the bottom line

Following the March 2014 ADF National Dairy Farmers' Summit's focus on improving farm profitability, the Australian Dairy Industry Council (ADIC) commissioned Dairy Australia to produce the Sustainable Farm Profitability Report.

The report, officially launched in July this year, focuses on the influences farmers can control, including how well they farm and how well they deal with risk.

For instance, dairyfarmers may not be able to control the hike of electricity, fertiliser and fuel costs, which continue to squeeze margins, but farmers can control how well they use these inputs to control the costs that have a major influence on their bottom line.

While there is no silver bullet to profitable dairyfarming in Australia, the ADIC hopes this report will provide a resource of information for dairyfarmers to run successful farm businesses.

Modest gains from Federal Budget

Modest gains were delivered in the 2015 Federal Budget for agriculture and small business, with initiatives that support decreased small business taxes, improved bilateral trade agreement outcomes, drought and infrastructure relief, and social and community support services for rural Australians.

The budget also included money for drought grants and loan schemes, however, this is the same money that was previously allocated but not spent.

Despite some success, we hope to see greater investment in agriculture from the Agriculture Competitiveness White Paper.

Opening up Market Access

Six months ago, together with the state dairyfarming organisations and the support of the Federal Government, ADF saw the successful conclusion of a pro-dairy China-Australia Free Trade Agreement (ChaFTA).

ADF has been advocating for the trade deal to be ratified and brought into force as quickly as possible. This will ensure our dairyfarmers receive the benefits of improved access to Asia's growing middle class population and close the gap between the Australian export market and our major global competitors who already have Free Trade Agreements (FTA) with China.

ADF also continues to advocate for a commercially meaningful conclusion to the Trans-Pacific Partnership to further reduce the industry's competitive disadvantage to its major global competitors. We are also working hard to reduce technical barriers to trade in key export markets.

'While there is no silver bullet to profitable dairyfarming in Australia, the ADIC hopes this report will provide a resource of information for dairyfarmers to run successful farm businesses.'

Addressing skilled labour shortages

Faced with a shortage of skilled labour and the need to fill vacancies with overseas workers, dairyfarmers encounter an uphill battle with current immigration requirements, which limit farmers' access to a productive, flexible and skilled workforce.

ADF is committed to securing a robust industry-wide labour agreement that will give dairyfarmers greater access to suitable overseas workers to help overcome the industry's chronic skilled labour shortage.

In addition, we continue to advocate policy that will streamline the application and approval process for 457 visas for skilled dairy workers, and reverse the restrictions on 457 visas introduced by the former Government.

Ensuring dairy retains social licence to operate

Our industry's long-term sustainability is dependent on not only how profitable we are, but ensuring that our industry maintains the confidence and trust of communities on environmental, social and economic issues. This becomes especially true as our industry seeks to capitalise on opportunities for growth.

Healthy and happy cows are a priority for every dairyfarmer. ADF is driving a proactive approach to demonstrate to consumers, customers and the community dairyfarmers' serious-

Skilled labour shortages is a key policy challenge for ADF to overcome in the next year.

ness and commitment to the health and wellbeing of their cattle.

ADF had significant involvement in the development of the *Australian Animal Welfare Standards and Guidelines for Cattle*, and will continue to advocate for the national rollout of these standards by government to fully implement them via state and territory regulation.

'It is important to remind ourselves that we can all be dairy advocates.'

ADF is also developing a whole-of-industry policy position on unconventional gas mining, including coal-seam gas.

We are developing an industry policy and supporting activities to ensure dairyfarmers can continue to operate and prosper without coal seam gas mining activities compromising the natural resources upon which the industry relies and without loss to reputation as a producer of high quality, safe dairy products.

Retaining social licence to operate is a never-ending effort, but without the support of our communities, the future of our industry will be lost.

ADF is committed to ensuring Australian dairy's voice is heard through government policies that support our industry and working with our industry bodies to ensure dairy's good practices are known and understood across the broader community.

It is important to remind ourselves that we can all be dairy advocates. Whether this includes promoting our high milk quality assurance standards, sound animal husbandry practices, care for natural resources or world-leading research and development at a family barbecue or local footy game — we can all play a part in positively promoting our industry.

To find out more about ADF's policy and advocacy work go to <www.australiandairyfarmers.com.au>.

Audits streamlined to cut farm costs

Key points

- ✔ Onerous requirements for individual audits
- ✔ Govt to streamline process for farmers
- ✔ Will encourage greater uptake of program

THE news that the Department of Environment will remove unnecessary audit requirements from the On-Farm Irrigation Efficiency Program (OFIEP) has been warmly welcomed by Australian Dairy Farmers (ADF). The relaxation of the requirements, which ADF has been advocating for more than 12 months, will save program participants in the southern-connected region of the Murray Darling Basin significant time, money and stress.

The issue arose when the Department of Environment insisted that every farmer who received funding from the OFIEP get an independent audit of their works, in addition to the individual farm compliance documents already held by the delivery partners.

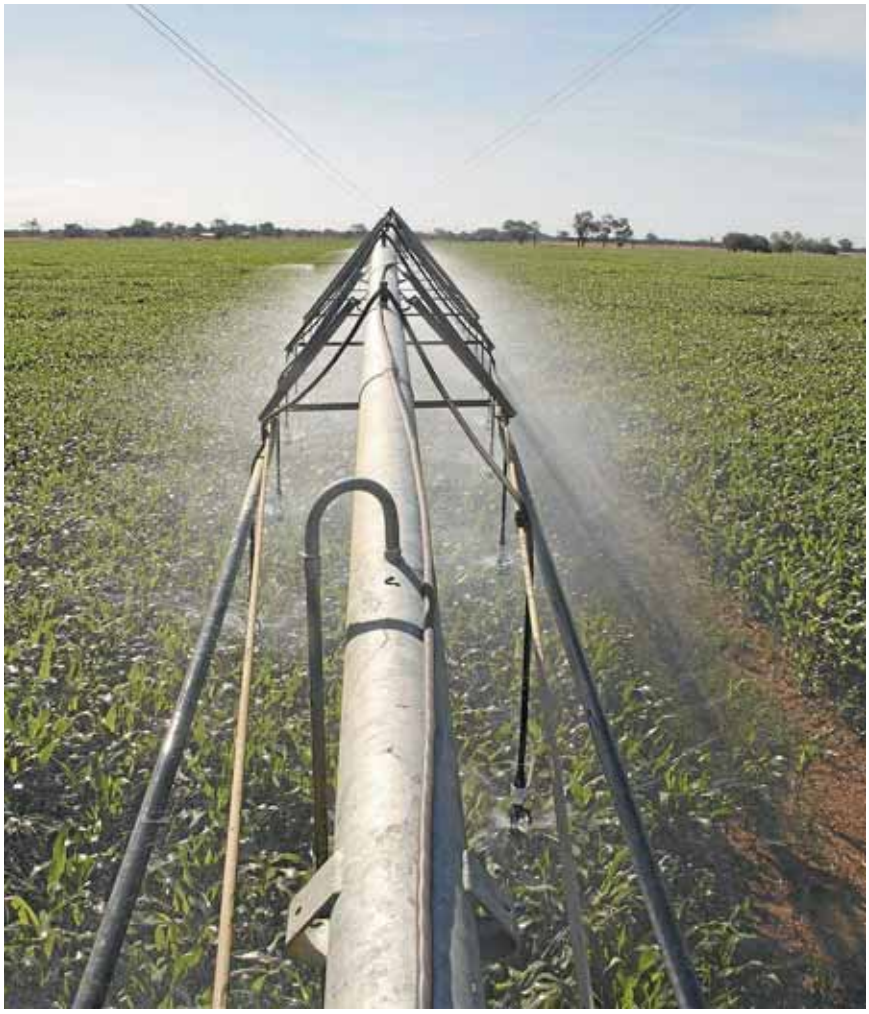
All of this was at the farmers' personal expense and within 60 days of the end of each financial year.

'Removing the additional requirements for farmers will mean savings of up to $2000, plus reducing the added pressure of going through an audit process.'

The audits were designed to ensure that each of projects was completed within the terms and conditions of work contracts and that the government funding provided was spent appropriately.

On Wednesday May 20, ADF received a letter from Parliamentary Secretary for the Minister for Environment, Bob Baldwin, acknowledging ADF's concerns around the cost imposition and stipulating alterations to the requirements.

Farmers are now instead required to undertake an audit at the end of their project, rather than at the end of each financial year, and may use their personal accountant rather than a costly independent auditor to do this review.



The relaxation of audit requirements will mean less time, money and stress for farmers.

Chair of the ADF natural resources policy advisory group Daryl Hoey said while farmers had no objection to being accountable for their spending, the audits ultimately became red tape.

"The requirements were onerous from a time and money perspective," Mr Hoey said.

"Removing the additional requirements for farmers will mean savings of up to $2000, plus reducing the added pressure of going through an audit process.

"Beyond this it will also assist in streamlining the way in which the program is rolled out, which may encourage greater uptake of irrigation improvement by farmers."

ADF is strongly supportive of infrastructure programs under the Murray Darling Basin Plan as it has demonstrated significant cost-benefit, with upgrades to existing infrastructure delivering about $9800/megalitre worth of increased farm productivity.

An important part of the 450-gigalitre recovery through on and off-farm infrastructure savings under the Murray Darling Basin Plan, the On-Farm Efficiency Program involves participating farmers transferring water entitlements back to the environment that are equivalent to half the savings they achieve.

In return farmers receive government investment on their farm to improve their capacity to produce more milk from less water. D

To find out more about ADF's work on water policy, go to website <www.australiandairyfarmers.com.au>.

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Dairyfarmers positive about future

THE National Dairy Farmer Survey results for 2015 have revealed that close to three quarters of the nation's dairyfarmers continue to be positive about the industry's future with almost eight out of 10 anticipating business profits this year.

Taking a deeper look at the results, the survey, which was conducted in March among 1000 farmers across the country's eight dairy regions, revealed that the views of farmers, particularly in the subtropical region, have changed markedly in the past two years.

In 2013, only 31% of subtropical farmers were positive about the future of the industry largely due to the impacts of $1 milk and challenging seasonal conditions. The contrast in 2015 is a stark one with positive sentiment now at 55%, a five-year high. The main reason driving this change is positive perception about the demand for milk underscored by recent Free Trade Agreements and Gina Rinehart's investment in Hope Dairies.

Nationally in 2013/14, 82% of farmers reported making an operating profit and a similar number (79%) anticipate being in the black again this year. Of those who were profitable in 2013/14, 88% are expecting to be profitable again this year and 38% of those who were in the red last financial year are looking forward to an operating profit this year.

Farms with herds of 300 cows plus were more likely to have had a profitable 2013/14 and to be anticipating a good 2014/15. Expectations of a better year are driving increased confidence on-farm with 52% reporting intentions to invest in the next 12 months, up from 48% last year.

The widely reported announcements about Free Trade Agreements with China, South Korea and Japan have been generally welcomed, with 64% of farmers believing they are beneficial for the industry due to the potential for market growth and 40% of farmers feeling they would receive direct benefit.

Interestingly, Dairy NSW (74%), Murray Dairy (68%) and DairySA (67%) were most positive about the benefits of the FTAs to the industry and manufacturers, presumably a result of the active promotion of these regions' products in China.

Repro Right adviser Dr Craig Dwyer has seen impressive on-farm results since doing the course.

Repro Right, showing fertile results, links with CSU

A partnership between Charles Sturt University (CSU) and Dairy Australia is set to provide a new pathway for higher education in the dairy industry. Launched in May, the new agreement will mean graduates of Dairy Australia's Repro Right Advanced In-Calf Adviser Training will be eligible for advanced standing into CSU's Master of Animal Science.

'Lifting the fertility performance of Australia's dairy herds is a strategic goal of the industry...'

Dairy Australia's program manager animal health and fertility Kathryn Davis said dairyfarmers' access to highly skilled professional herd reproduction advisers around the country is assured by this development.

"Lifting the fertility performance of Australia's dairy herds is a strategic goal of the industry as it has important implications for the better health of our cows and the ongoing profitability of our dairy businesses," she said.

The first Repro Right course to upskill vets, advisers, herd managers and extension field staff was held in 2013. The intensive 10-month professional development program incorporates a mixture of online learning, multi-day group sessions, assignments and practical tasks on important elements of reproductive management in Australian dairy systems.

Dr Craig Dwyer, a vet in Smithton, Tasmania, is a Repro Right adviser and has seen impressive on-farm results since doing the course.

"Repro Right brings together all the many parts of reproduction on-farm and takes it to a higher level by using data analysis, so farms and their advisers can identify weaknesses and work together to improve," Dr Dwyer said.

Emphasising that there is no 'silver bullet' for reproduction Dr Dwyer said the complete picture needed to be examined across a significant timeframe. "A measured, consistent and realistic approach is the best way to go," he said.

Repro Right allows for an overall plan for reproduction to be developed for the farm as there is no one-size fits all and plans must be tailored to meet the overall goals and expectations of the farmer.

"Employing the skills I learnt from the Repro Right course has led to increases in fertility, and on one farm I saw an improvement in the six-week-in-calf rate of more than 15% in one year," Dr Dwyer said.

To find a Repro Right adviser, visit website <www.dairyaustralia.com.au/reproright>.

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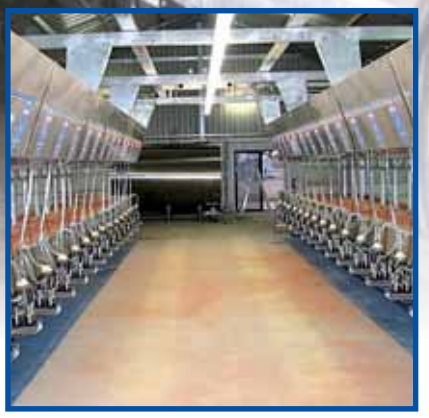

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Dairy Australia Round Up

employ staff, in addition to the great opportunities, there are also many challenges.

"Recent media scrutiny about the employment of casual workers is a timely reminder that Dairy Australia's Employee Starter Kit initiative (ESKi) details all the mandatory human resource requirements for dairy businesses employing staff, including the latest legal, financial and on-farm safety obligations," Dairy Australia's group manager, industry, people and capability, Shane Hellwege, said.

ESKi is an easy-to-use employer pack that was developed to help support farmers attract and retain skilled workers.

More than 1000 ESKis have been distributed across the industry. Built from The People in Dairy website, the ESKi was piloted by 30 farmers before being initially launched nationally in late 2013.

Farmers can pick up a copy of the ESKi folder through Dairy Australia's regional development programs. ESKi folder updates and an online version of the resources are available at website <www.thepeopleindairy.org.au/eski>.

What's Mid-Infrared Spectrometry (MIR) got to do with milk?

In May, Dairy Australia was successful in receiving Federal Government funds in the first round of grants under the $100 million Rural Research and Development (R&D) for Profit Program. MIR for Profit, a project championed by DA's program manager for genetics and data management Matt Shaffer, received $927,273.

"I was very surprised and pleased when I heard the news, because MIR will become one of the most exciting projects we have on the go," Mr Shaffer said.

MIR spectrometry for Profit will develop new tools to help dairyfarmers manage and select the most profitable cows by using technology to scan milk samples for genetic, health and production information. The results will inform breeding and management decisions to improve the profitability of the national herd.

"It's a technology that has been under development overseas for a while and can be used as part of herd testing. By analysing of pattern of light shone through milk, data such as fat and protein levels as well as information on body condition and methane emissions from the cow are revealed," he said.

One of the best things about this project is that it leverages the international work that has already been done and should quickly put an effective tool into dairyfarmer's hands.

The project will test the overseas predictions to ensure they work under Australian conditions.

"MIR data should improve the accuracy of genetic evaluations and add another dimension by incorporating MIR data with the large genomic databases we have," Mr Shaffer said. "Matching the spectra data with the phenotype of animals in the herd allows you to predict better and more profitable management approaches."

Within three years the tool should be available for use during herd testing and provide farmers with a report that specifically identifies cows at risk, for example, of negative energy balance.

"Armed with these predictions, farmers can then intervene to manage their cows more profitably, targeting fertility, health and nutrition treatments of specific cows," Mr Shaffer said.

In addition to Federal Government funds, Dairy Australia, the Victorian Department of Economic Development, Jobs, Transport and Resources, the Australian Dairy Herd Improvement Scheme and the National Herd Improvement Association of Australia will contribute to provide a combined total of $2 million for the project.

DA online library recently upgraded

Dairy Australia's online library has recenty been upgraded to help make it easier for levy payers to search for information and images.

"Today, everyone wants access to information quickly and easily, so we have recently upgraded our online library," library manager Vesna Vukasin said.

DA's online library can be accessed under the Quick Links section on the DA website home page.

"We are committed to providing a great service and would love to hear what you think of the new database," Ms Vukasin said. D

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Brave new corporate world of dairy

Barely a month goes by without an announcement about a new corporate investment in the Australian dairy industry. All eyes seem to be on getting big volumes of product into Asian markets. The corporate investments are inevitably large, often with vertical integration into a processing arm. But there is some divergence in the proposed models — from co-operatives to retention of current farm owners as managers to greenfield sites in non-traditional dairy areas. One investment scheme in south-west Victoria has already failed to meet the timeframes it initially proposed, taking longer to find the Chinese investors it targeted. The next few years are certainly going to be interesting for the Australian dairy industry, as the blow-torch of day-to-day management of intense operations is applied to the new models. The *Australian Dairyfarmer* takes a look at three of the proposed investments currently on the table.

Frustration grows over proposed SW dairy buyouts

THE HOBART property developer, seeking to buy up dairy farms in Victoria's south-west and South Australia, has been asked to give a clearer picture of its plans by the United Dairyfarmers of Victoria (UDV).

Linear Capital shot to prominence last October with bold claims it planned to buy 50-70 dairy farms to attract interest from the Chinese market, but the industry is unsure on how the company is progressing with its aim.

UDV president Adam Jenkins said farmers wanted to know how Linear's plans were progressing. "We would welcome a conversation with them in terms of who is involved so we can draw a clear line in the sand," Mr Jenkins said. "We need some clear guidance on where people stand."

If Chinese investment was not forthcoming, farmers needed to know Linear's options.

He said offshore investors were not the only sources of alternate capital. "If there is a way to capture some Australian super funds that would be good — if one buyer is gone, other doors may be opened," Mr Jenkins said.

He said farmers who had signed up with Linear might need legal advice if they wanted to seek other buyers.

The company remains upbeat about the plans despite refusing to confirm or deny whether sale contracts had been signed.

It is believed farmers between Colac and Mount Gambier, South Australia, have been approached to sign "individual option deals" to eventually sell their properties. Other property owners said they would be selling their farms outright.

There is yet to be any official release from Linear naming the Chinese investors with which it is working. Plans to launch the project, first announced in October last year, have progressively blown out, with no date yet set for the purchase of the farms.

The company has employed international firm FTI Consulting to speak on its behalf. Senior director of strategic communications Sarah Brown said progress was being made on the deals.

"We are continuing to make positive progress with the farmers we're working with and on the investor side," Ms Brown said. "While the completion of those sales has taken longer than we would have liked, we have strong support from farmers and investors alike and look forward to bringing this exciting new project to the region."

Ms Brown said Linear Capital was "a diverse private investment firm whose principals have wide experience in a broad range of sectors".

In Victoria, one farmer said producers in the Heytesbury area had been approached to set up a cluster, or "hub", of farms.

But farmers in the South West are becoming frustrated with the continued delays.

Dairyfarmer Chris Gleeson, Elm Banks Holsteins, Crossley, near Warrnambool, said Linear seemed to be continually postponing the project. Uncertainty was not helping farmers who were seeking to leave the industry, he said.

"It leaves farmers in a very difficult position to farm," Mr Gleeson said. "Is it good for the industry to be coming and promising to do this and that? If you don't have your 'i's dotted and 't's crossed it's more of a headache for the industry than anything."

—Andrew Miller

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"We saw a substantial reduction in mastitis in the cows. But a much greater reduction in the heifers" - Ray Stefani, Tonsan Holdings, Fish Creek

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Management of mastitis is most commonly focused on lactating cows. However, the prevalence of mastitis in unbred, breeding age and pregnant dairy heifers is higher than formerly realized, according to Dr Stephen Nickerson, Professor at the University of Georgia.

"Heifers may carry intramammary infections for a year or more before they are diagnosed with mastitis," he reported. "The greatest development of milk-producing tissue in the udder occurs during the first pregnancy, so it is important to protect the heifer mammary gland from pathogenic microorganisms to ensure maximum milk production during the first and future lactations."

Dr. Nickerson reported that dietary supplementation to boost the immune systems of heifers has been shown to reduce the incidence of mastitis at calving.

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Ray Stefani (left) with herd manager, Russell Francis.

Fish Creek dairy focuses on improving immune status

Ray Stefani in Fish Creek, Victoria, started adding *OmniGen-AF* into the lead feed and milker ration of his 300 cow herd in July 2013 hoping it would help support the immune system of the cows and assist with his ongoing mastitis issues in early lactation.

"In the first year, we halved the mastitis treatments in fresh cows. In the heifers, we treated only one third the number we usually do. I was impressed" Ray said.

"Also, the cows just calve by themselves on *OmniGen-AF*. Unassisted! They just push the calf out" Ray says. "Calving is stress free for them, and for me. They come into the herd, and milk well" he continues.

"We fed *OmniGen-AF* to our herd again in 2014 and saw herd mastitis treatments halved again" says Ray. "I am so impressed with the results, it will become a standard inclusion. Hassle free calving. That's what I get using *OmniGen-AF*, which frees up my time during calving to do other things. That's what I want."

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Dairy's cream combines

A LONG-STANDING friendship between two of Australia's biggest dairy-farming families is to be cemented into a business partnership that will buy and expand the Lachlan Valley's big 3700-cow Moxey Farms dairy business.

The Moxey family has signed a heads of agreement deal to sell its farm at Gooloogong, NSW, and then join new owner, the Australian Fresh Milk Holdings (AFMH) consortium, which includes fellow large-scale Sydney basin farmers, the Perich family, of Leppington Pastoral Company.

The AFMH partnership also involves Asian dairy giant New Hope Dairy Holdings, part of China's biggest private agricultural, financial services and real estate company, plus the fast-growing Australian food-processing business Freedom Foods.

Freedom already has a foothold in the export dairy market packing ultra high temperature (UHT) treated milk under contract for New Hope's Chinese markets while also being the biggest shareholder in the trans-Tasman A2 Milk Company, which also exports to Asia. Both the Perich and Moxey farms supply some of their milk to A2.

No figure has been confirmed for the AFMH acquisition, although business analysts estimated the Moxey enterprise — Australia's biggest single site dairy operation — was worth about $100 million last October when the family flagged it was looking for outside capital to expand its successful business model.

Details of how AFMH's ownership will be divided up are still to be finalised, as

Quentin Moxey in the family's large dairy operation in central west NSW that will be sold to a consortium, including his family, and which plans to build new dairies.

is Foreign Investment Review Board (FIRB) approval for New Hope's involvement in the purchase, although the partners hope the deal will be settled within a few months.

—Andrew Marshall

First piece in the puzzle for dairy empire

THE INK is now dry on the first official farm purchase of Camperdown Dairy International (CDI), a start-up corporate dairy business that plans to process 700 million litres of raw milk a year for export as milk powder.

Bill McDonald, managing director of the MCG Group, which has an 80% stake in CDI, said the company had agreed to terms for a 3000-hectare property at Neuarpurr on the Victorian-South Australian border earlier in the year, with settlement taking place in June.

The Neuarpurr purchase is the first piece in the puzzle of an ambitious project that will eventually see CDI buy five more properties of equivalent size with plans to milk 38,000 cows at any one time in what is believed will be Australia's largest dairy farm aggregation once it is at full production.

Mr McDonald said the company was in negotiations for other properties, but could not reveal their location due to commercial in confidence constraints.

He revealed they would be spread over a wide geographic area right up into the Riverina in New South Wales.

The cows will be sourced from across Australia, and American genetics will be used to create a self-replacing herd. Around a sixth of the cows will be going to the Wimmera property.

Mr McDonald said the key tenet to the business was being as vertically integrated as possible. "We ultimately want to have to outsource diesel, fertiliser and wages and that's it," he said. However, he said it was likely the business would need to source milk elsewhere and was offering large producers long-term supply contracts.

The milk will be produced at the farms and partially processed before being taken to Camperdown for processing.

Investment in the processing capability at Neuarpurr alone is expected to cost $40 million.

China is the major destination, accounting for 60% of production, but Mr McDonald said exports would also be heading to the Middle East and America. "You don't want to focus on just the one market," he said.

—Gregor Heard

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Mike Larcombe: one of a kind

By **Carol Millar**

THE herd improvement industry recently lost one of its most distinguished members with the death of Dr Mike Larcombe. This was his citation for the National Herd Improvement Association of Australia (NHIA) Meritorious Service award in 2011:

"After graduating in Veterinary Science from Melbourne University, Mike began his career — like so many other vets before and after him — at the Maffra Veterinary Centre, under the eagle eye of Dr Jacob Malmo.

"During quiet afternoons, his interest in computers and statistics led him to work on a software project to build a system that could analyse the breeding records of dairy cattle in order to better help dairyfarmers to understand fertility issues. This was to become the first of Mike's software solutions for the dairy industry.

"As the pleasures of pregnancy testing and trimming cows' feet began to wane, Mike decided in 1986 to start his PhD, which resulted in the development of (an) UDDER. In this case, UDDER was the name of a software program specifically developed for consultants to provide answers to questions like 'how much grain should this farmer be feeding' or 'what is the best calving pattern for this farm'. It is a program that is still in use and assisting consultants today in Australia and New Zealand.

"Following the completion of his PhD, Mike found employment as a consultant with Maffra Herd Improvement Co-op as it was then known — a forerunner to Hico today. This was quite a gamble on the part of the Maffra board in those days but they recognised the importance of local dairyfarmers having access to better advice and technology.

"While Mike was sharing an office with the four data processors at Maffra, it soon became clear to him that the co-op was struggling to manage its semen inventory. Perhaps a slightly different interpretation was also that the system could not keep up with the demands of the new, young field officer named Stewart McRae. Mike soon found himself, again, spending quiet afternoons coming up with a computer software program to manage the semen stocks at Maffra.

"At the time, in the early 1990s, there was a centralised herd-recording system based at Herd Improvement Organisation (HIO) in Victoria but it was using old technology and the system as a whole was suffering from the huge cost of communication — in Maffra alone there was spending of $100,000 per annum on a dedicated communication line to HIO.

"The hope was for a national herd recording system to be established, however, after three years of expensive programming and no end in sight to the problems, the boards of Maffra and Yarram Herd Testing Association took the brave decision to move towards a more local solution and the MISTRO herd-recording system was launched in 1994.

"Very quickly, Mike's role at Maffra HI expanded from consulting and into software development, and soon Northern Herd, Timboon HI and South Gippsland Herd Test Association joined the MISTRO system as well.

"The DOS-based version of MISTRO Farm for farmers was released in 1996 as the first of a suite of products developed to make farmers' lives easier. After the introduction of the GST, this was followed by MISTRO Finance in 2000.

"In 2002 the MISTRO team was expanded with the addition of Tim Sargent and the task of upgrading MISTRO to a Windows platform began. The Windows versions of the MISTRO herd recording, semen inventory and farm program were released in 2004/05.

"When you ask anyone in the herd test sector about Mike Larcombe, almost all will mention his 'can do' attitude to software development. If anybody had an idea and wanted to see if it could be incorporated into MISTRO, you only had to ask Mike and he would find a way to make it happen. It is no exaggeration to say that Australia is extremely fortunate to enjoy one of the most flexible and cost-effective herd-recording software programs in the world — and it is all thanks to the approach of Mike Larcombe using his quiet afternoons to solve the computer problems of the dairy industry.

"In recent times, Mike and his team have worked with the Australian Dairy Herd Improvement Scheme (ADHIS) to develop the genomic database system for storing and analysing DNA profiles of animals.

"The hallmark of Mike's career has been his ongoing quest to use information technology to advance the cause of herd improvement and to make Australian dairyfarmers more profitable. Our industry is indeed very fortunate in having somebody with Mike's drive and intellect to accomplish this very important task."

Vale and thank you Mike.

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Cows create awesome careers

Key points

- ✔ Cows Create Careers
- ✔ Highlights ample opportunities in dairy
- ✔ Great support for young people to enter industry

TWENTY-THREE year old, Ashlee Hammond, is passionate about shining a light on agriculture. "I love everything about the industry, and it's an industry that continues to grow," she said.

"Consumers want Australian-made and they want the story behind where their food comes from; this has driven me to be passionate about consumer education and awareness — people are starting to value that our agricultural industry has a clean and green image."

Growing up in Northern Victoria, Ms Hammond milked on her parent's dairy farm after school and worked as a farmhand on weekends.

In 2007 she participated in Dairy Australia's Cows Create Careers project as a year nine student at Kerang Technical High School, and even though she came from a dairy background, Cows Create Careers still offered her new ideas.

"Cows Create Careers was definitely beneficial and I got a lot out of it," she said. "On farm you just do what dad says — so it was interesting to get all of the background knowledge. It was also beneficial because I could teach other students in the class — indirectly, it allowed me to learn leadership skills and I could develop those skills at a young age."

During high school, Ms Hammond elected subjects that helped to open agricultural tertiary pathways. In years 10 and 11, she also completed the Vocational Education and Training (VET) Certificate II in Agriculture, which saw her place first in the Murray Mallee VET Student Excellence Awards and awarded the 2009 Steve Foley Memorial Student of the Year.

"It was only after year nine that I started to think about agriculture as a career choice — it was through Cows Create Careers, and then the Certificate II in Agriculture, that led me to realise that you can study at a tertiary level and there are many pathways in agriculture, it's not just milking cows" she said.

Ashlee Hammond plans to complete a Master of Agribusiness.

At the end of year 12, Ms Hammond successfully applied to study Agricultural Science at La Trobe University, Bundoora. In 2014, she was awarded the University's Honours Year Grant Scholarship and completed an additional 12-month research project into ruminant nutrition.

'I've always been supported by the industry — it started with Cows Create Careers, developed with the Certificate II of Agriculture, then onto university.'

"I conducted research with the overall aim of improving the nutrition of grazing dairy — specifically looking at the efficiency of utilisation of dietary protein in the rumen through the use of biomarkers in milk," she said.

Ms Hammond has worked part-time with the Victorian Farmers Federation (VFF) member services team for 18 months. In April, with her study now complete, she took on a full-time contract as VFF livestock project officer. "I'm an extension officer for increasing awareness for animal health and biosecurity," she said. "I organise events and get out there and talk to farmers."

However, outside of work, Ms Hammond's passion is to spread the word about Australia's clean and green agricultural industry. She has been an active member of the Young Agribusiness Professional's Committee for three years and is enthusiastic about increasing the awareness of industry careers.

"I've always been supported by the industry — it started with Cows Create Careers, developed with the Certificate II of Agriculture, then onto university," she said. "I'm really passionate about supporting youth and increasing the awareness of the opportunities that young people can have in agriculture."

Ms Hammond plans to continue her studies and was recently accepted into a Master of Agribusiness course, which she plans to complete part-time while working. She is looking forward to a long career and hopes to one-day work in the area of her research.

"Dairy is my ultimate passion," she said. "I love dairy and that's going to be where my passion lies, no matter what area I go into."

Advice for young people

ASHLEE Hammond's advice for people considering a career in the agriculture industry:

"If you want a hands-on job or wish to study at a tertiary level, there will be a pathway that suits you. There are so many different paths and such a range of jobs — no matter what sort of area that you want to get into; agriculture has a job where you can do it."

Dairy Australia
National Centre for Dairy Education
Your Levy at Work

Scholarship lands jobs for young guns

Key points
- ✔ Manufacturing scholarship graduates gain jobs in dairy
- ✔ Program attracts top candidates
- ✔ Gives exposure to whole industry

ANOTHER three young university graduates have been snapped up by dairy processors as a direct result of the Dairy Australia 2015 Manufacturing Scholarship.

Alexandra Kury is now employed with Mondelez International as a nutrition analyst supporting dairy. Ailsa Rajasingham is a technical co-ordinator with Burra Foods developing specifications for raw materials and assisting in the new product development process and Claire Walpole recently joined Peters Ice Cream as a graduate research and development technologist.

Ms Kury, who graduated from the University of Sydney with a Master of Nutrition and Dietetics last year, said the scholarship had played a key role in securing her position with Mondelez.

"If it wasn't for the scholarship program I wouldn't have my job now," she said.

"The scholarship prepared me for the job and gave me an amazing insight into the industry. Before the scholarship I had no real exposure to the dairy industry. During the program I was able to see the manufacturing processes in detail and I have already been able to apply what I learnt to my new job.

"I really enjoyed travelling with the milk tankers and field officers onto the farms and interacting with the farmers to appreciate their perspective on the industry as well.

"I would definitely encourage any new graduates to apply for the scholarship."

Ms Rajasingham, who recently completed a Graduate Diploma in Food Science at the University of Melbourne, said the scholarship was the perfect bridging program.

"It gives you the kind of exposure and experience that puts you ahead of other graduates," she said.

"The scholarship allowed me an inside look at how companies work and what the different roles entail in dairy manufacturing.

Dr Hubert Roginski from the National Centre of Dairy Education (NCDE) discussing raw milk quality and analysis with Ailsa Rajasingham, Kate McMaster and Claire Walpole.

"But the biggest thing for me was the farm visits. You can't understand the industry entirely until you visit the farm where it all starts, and understand the issues the farmers face as well as knowing where the product is coming from."

The scholarship has been running since 2006; 24 of the 28 trained graduates who participated in the program are now working in Australia, with 75% of those in dairy food and related industries.

'You can't understand the industry entirely until you visit the farm where it all starts.'

Dairy Australia program manager Dr Mani Iyer said he was thrilled with the intelligence, commitment, energy and enthusiasm for dairy shown by this year's four graduates and was delighted three had found jobs in the industry.

"This year's graduates proved themselves to be the cream of the crop using the scholarship as a launching pad for exciting careers," Dr Iyer said. "They are our future dairy leaders, and we need to continue attracting talented and high-calibre graduates who are passionate about dairy."

Kate McMaster, who also completed this year's scholarship, has been discussing opportunities with potential employers.

A key aspect of the success of the scholarship is the continued strong support and active engagement of dairy industry sponsors. This year the participants completed placements at sponsoring companies: Warrnambool Cheese and Butter, Murray Goulburn, Bega Cheese, Barossa Valley Cheese, Yarra Valley Dairy, Fonterra, Burra Foods, Parmalat, Lion and Coles.

Murray Goulburn innovations manager Alysha Curtis said the scholarship program was a perfect opportunity to expose MG to high-calibre students they might not get the exposure to otherwise.

"If we don't participate we're effectively hoping future leaders will fall into the industry by chance, whereas through programs like these we can help students effectively plan their career in dairy," Ms Curtis said.

Fonterra Australia HR consultant Andrew Hilliard said the strength of the manufacturing scholarships program was that selected participants had gone through a rigorous selection process.

"The scholarship provides them with endless opportunities and is a good way for us to showcase Fonterra to new potential talent," Mr Hilliard said.

UDV agrees to get on front foot

Key points

- ✔ UDV to work to phase out induction
- ✔ Vital to be on front foot on difficult issues
- ✔ People trust activists more than industries

By **Laura Griffin**

VICTORIA'S peak dairy lobby group has voted to actively phase out non-therapeutic calving induction before it becomes a controversial community issue.

United Dairyfarmers of Victoria (UDV) members voted at the group's annual general meeting to support a motion on the issue put forward by the Wannon UDV branch.

Branch member Chris O'Keefe said using calving induction as a herd management tool had "probably had its day" and that it presented a poor image and potential market risk. "Acting now, we can transition away from calving inductions on our own terms rather than at the behest of animal activists or government intervention," Mr O'Keefe said.

The benefit of being on the front foot on potentially controversial issues, such as calving induction, bobby calf treatment and environmental impacts, was the key message of communications expert Katherine Teh-White to the conference.

Ms Teh-White, who is the founder and managing director of Futureye, said although it was tempting to sweep such issues under the carpet, various industries — including live exports and greyhound racing — had discovered the hard way that such a strategy only made the situation worse and resulted in community backlash, boycotts, lack of market access and increased regulation.

Instead, she urged the dairy industry to understand community expectations and be active when a performance outside of these was identified and respond by releasing information to stakeholders and the media on its own terms.

She said this was vital to build trust, which needed to be nurtured by showing the community how industry was addressing the general public's concerns.

"You have to involve critics in those discussions, which is controversial in agriculture because this is when you are listening to the people you hate the most — the activists who think your animal welfare standards aren't good enough, who say there are problems with your product," she said.

Communications expert Katherine Teh-White (centre) says the dairy industry should learn from the mistakes other industries have made in exacerbating crises and losing "social licence".

> ***'Acting now, we can transition away from calving inductions on our own terms rather than at the behest of animal activists or government intervention.'***

"It is important to engage these critics, because the community trusts them more than you. It is unfortunate, but industry is not as trusted as activists are, and government is about as trusted as a used-car salesman.

"To say you're going to rely on their regulatory and science only is to say you are relying on a used-car salesman to set the right price."

She warned that industry could not rely on government support when a crisis hit.

Australian Livestock Exporters Council chief executive Alison Penfold said her industry had had to claw back community trust after the infamous Four Corners exposé that prompted the Federal Government to temporarily halt that operation.

Ms Penfold said the industry had learned a lot and, in hindsight, members realised they could have taken control of the issue faster and more effectively by being more transparent, acknowledging the legitimacy of community concerns and engaging with animal activists.

She said to improve practices and build community confidence, the live export industry had spent $23.6 million (or about 70% of levies) on addressing animal welfare concerns in the past four years.

This included complying with the Exporter Supply Chain Assurance Scheme and providing in-country training for export destinations, which involved initiating significant cultural changes.

Ms Penfold said the industry would launch a mission statement soon and was continuing to work to improve its systems. D

Seeking answers to engaging activists

Q: Are you worried that if something does go wrong with coal seam gas extraction, it will take a long time to fix?
— John Versteden, Longwarry, Vic, dairyfarmer.
A: There are concerns compared with unfounded fears; for example our farm is reliant on groundwater and we wouldn't do anything to jeopardise that (when we decided to work with gas companies to explore and extract gas from their Queensland farm). I also have the belief that humanity is pretty good at finding solutions, which might not be a popular view. And we need to take some level of risk, if we didn't take risks to do anything new than we'd be living like cave men.
— Peter Thompson, Queensland mixed farmer.

Q: WHERE should the industry draw the line in dealing with extreme activists?
— Ron Paynter, Ellinbank, Vic, dairyfarmer.
A: It is important to understand the range of views, including the most extreme views. From there, an industry can start the discussion and come to a consensus on how to deal with an issue, and the parameters of what it will and will not negotiate.
— Katherine Teh-White, Futureye managing director.
A: The challenge of industry leadership sitting across the table when someone wants to shut you down is a difficult one, and it's even harder to take your membership with you. But you've got to do it and bring them into a discussion about areas we can negotiate.
— Alison Penfold, the Australian Livestock Exporters' Council chief executive.

Q: At what point do we talk about farmers treating animals better than some people treat other people?
— Tony Marwood, Bonlac Supply Company chair
A: We have a societal agreement that doesn't accept a lot of behaviours so they are crimes, like murder. And industries have to make industry-wide agreements that are in accord with social expectations, to rule out some behaviours and follow through, so if there is a live exporter who is not doing the right thing then the industry has to be seen to kick them out of the industry.
— Katherine Teh-White, Futureye managing director.

Q: I think the live export debate changed when a mum and her two daughters stood up on TV and told the country how the live export ban had impacted them. How important is finding the personal story?
— Vin Delahunty, United Dairyfarmers of Victoria manager
A: Yes, it turned the community largely against the government's ban because of its impact on producers, and is an extremely valuable one. But it needs to be part of a broader narrative, including addressing the core problems by training workers overseas on animal welfare, and showing the community that journey — we came from sometimes poor practices and look at what we're doing to address them.
— Alison Penfold, the Australian Livestock Exporters' Council chief executive.
A: It can be a risky strategy if the person being interviewed doesn't reflect the industry.
— Katherine Teh-White, Futureye managing director.

—Laura Griffin


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Dairy processors reject GM pastures

Key points

- ✔ Processors concerned about GM ryegrass
- ✔ Consumer concerns create too big a risk
- ✔ Coexistence and segregation major challenges

By **Carlene Dowie**

AUSTRALIA'S dairy processors say more needs to be done before they can support the use of genetically modified (GM) pastures on farm. The use of GM pastures was too big a threat to markets both domestically and internationally to be acceptable at this time, Australian Dairy Products Federation executive director Dr Peter Stahle told the United Dairyfarmers of Victoria (UDV) conference.

Australian researchers at the Dairy Futures Co-operative Research Centre are developing a high-energy ryegrass, which could increase milk production by 10-15% per hectare and which is getting close to commercial trial stage.

The UDV has held a number of forums this year to discuss GM ryegrass and the potential pathways in the future. "We need to make sure we lead the debate … so we can access technology that will be beneficial to us," UDV president Adam Jenkins said.

But Dr Stahle said consumer concerns about GM meant there was potential for a negative reaction. "This creates a business environment where the companies have a deep concern for market risk if and when industry engages with these technologies," he said.

Companies were also concerned Australia's competitors, particularly New Zealand, could use being non-GM free to its advantage if Australia adopted the technology.

"Particularly in regard to trade, it provides an opportunity for non-tariff barriers to be created against our products," Dr Stahle said.

Processors supported the application of non-GM research to improve the productivity of pasture species, he said.

Peter Stahle: GM pastures a market risk for dairy.

Australian Dairy Farmers president Noel Campbell said processors were being cautious, but realistic, about GM technology.

The industry did not want to risk dairy's position with consumers.

"They (the processors) are in the best position to decide that because we (farmers) are not at the coalface with supermarkets or the consumer; they are," he said.

Dr Stahle said coexistence and segregation were major challenges for dairy's use of GM technology.

NZ study tour shares insights

Key points

- ✔ Study tour invaluable for young people
- ✔ Looking at specific aspects of NZ industry
- ✔ Helps develop leadership skills

ALL SIX participants of the 2015 New Zealand Study Tour attended the United Dairyfarmers of Victoria (UDV) Conference earlier this year to share their experiences from the annual initiative funded by the Gardiner Dairy Foundation.

The next generation of Victorian dairy industry leaders reported the tour to the South Island of New Zealand provided valuable insights into farming practices, which they can learn from and adapt to improve farming locally.

'The UDV aims to provide the next generation of dairy leaders with an opportunity to learn from our neighbours.'

Chair of Gardiner Dairy Foundation, Mike Taylor, said the New Zealand Study Tour provided young members of the dairy industry with an opportunity to examine best practice, build leadership capabilities and expand their networks.

"The Gardiner Dairy Foundation is proud to partner with UDV every year to undertake the annual New Zealand Study Tour, which focuses on providing young dairy leaders professional development that aims to harness their passion and encourage them to bring key learnings back home," he said.

The six participants involved in this year's tour highlighted how the experience was valuable to them.

William Ryan, Dumbalk, Victoria, said New Zealand farmers had strong business acumen and thorough understanding of economics.

Kerrilyn Bassett, Kyabram, Vic, said the environmental impact of farming, combined with water quality and nitrate leaching, were of particular interest.

Aaron Thomas, Binginwarri, Vic, said pasture-based systems and breeding programs played a key part in New Zealand's success, while Sarah Saxton, Frankston South, Vic, spoke about the benefits and pitfalls of operating in a co-operative dominant industry.

New Zealand Study Tour group participants William Ryan, Hayden Hanratty, Kerrilyn Bassett, Aaron Thomas, Sarah Saxton and Jason Bermingham spoke at the UDV conference.

Jason Bermingham, Nambrok, Vic, discussed the multiple support networks available to farmers in New Zealand, while Hayden Hanratty, Foster, Vic, said dairyfarmers in New Zealand had an obvious confidence and passion for their industry.

UDV president Adam Jenkins said important programs like this were important in supporting Victoria's emerging dairy leaders.

"We are committed to working with partners like the Gardiner Foundation on initiatives like the New Zealand Study Tour to encourage keen young dairyfarmers to develop knowledge and build leadership qualities," Mr Jenkins said.

"The UDV aims to provide the next generation of dairy leaders with an opportunity to learn from our neighbours and maintain world's best practice here in Victoria."

To find out more about the Study Tour, visit website <http://udvdairytour.com>.

Aus dairy stable amid global volatility

Key points

- ✔ Australian domestic market protected industry from volatility
- ✔ El Niño likely to drive up input costs
- ✔ Global markets weak into 2016

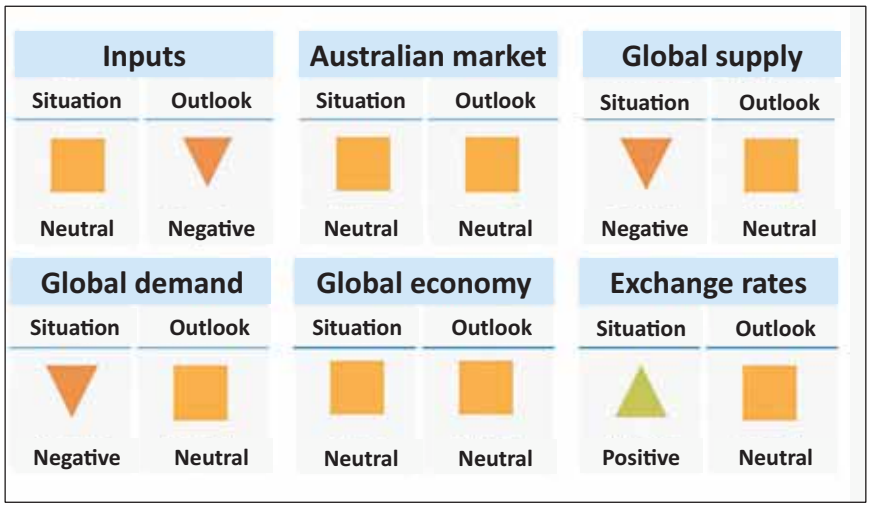
THE Australian dairy industry has shown remarkable stability in the past 12 months despite turmoil on international markets, according to Dairy Australia's *Situation and Outlook* report released in June.

Although global prices have fallen significantly and remain depressed, Australian farmers have been somewhat insulated from the volatile world market by relatively stable domestic market.

"The more stable returns generated by the Australian domestic market, which consumes around 60% of milk production, have helped cushion the industry through an internationally volatile 2014-15," Dairy Australia's managing director, Ian Halliday, said.

"But also having a diverse range of markets and products has paid dividends for Australian exporters this season. It spreads our exposure to the volatility the global market can present at times, hence we haven't felt the pinch of China's decreased bulk powder imports off the back of their domestic surplus."

Figure 1: Six drivers of the Australian dairy industry.



The report said the domestic industry had been considered "something of a 'handbrake' on industry returns through the buoyant 2013-14 season", but had protected Australia from the extreme volatility of 2014-15.

A tale of two markets

Key points

- ✔ International market showing weak demand
- ✔ Production continues to grow in export nations
- ✔ Australian domestic market showing steady growth

SUBDUED demand on international dairy markets is being counterbalanced by steady growth in Australian domestic markets — a situation likely to continue until the end of this year, according to Dairy Australia's *Situation and Outlook* report.

The international market is marked by lacklustre demand and growing supply.

Chinese and Russian demand is still sluggish, but brighter spots on the market are South East Asia, Mexico and the Middle East, which have recorded double digit export volume growth.

The report said buying interest out of China had remained relatively quiet, having dropped away significantly in early-to-mid 2014.

Milk powders had been most heavily impacted, with skim milk powder and whole milk powder down 21% and 25%, respectively, for the 12 months to February.

Liquid milk (largely UHT) exports to China grew 54%, primarily coming from the European Union, followed by Australia.

In Russia, the combination of the banning of key suppliers, and a sharply weaker currency, have seen dairy imports plummet, with total exports to Russia down 75% for the August to February period following the introduction of the embargo.

Exports to Japan have bounced, which is important for Australia, as until recently Japan was the biggest market for Australian dairy exports. Global dairy exports to Japan for the 12 months to February 2015 were at their highest since 2007, and experienced their strongest growth since 2005.

Supply growth

The report said with most farmers in major export regions enjoying fa- ▶

But the report pointed to some clouds on the horizon for Australian dairy — in particular around input costs and global market uncertainty.

Input costs was the only one of the key six drivers for the Australian dairy industry given a negative outlook.

The key reason was the declaration of an early stage El Niño event. Grain and hay markets had already responded to this, with strong domestic grain prices.

The forecast was also likely to discourage grain and hay producers from selling early in the lead up to the 2015 harvest.

It had also driven up the price of temporary irrigation water.

The report gave two drivers — global supply and global demand — a negative rating for the current situation but moderated that to neutral for the outlook.

"Internationally, prices remain depressed; the result of abundant supply and lacklustre demand," the report said.

'But also having a diverse range of markets and products has paid dividends for Australian exporters this season.'

Although price cuts in Europe and New Zealand were likely to curb global milk production, most dairy exports regions were still growing.

"A significant and sustained uplift in commodity pricing is considered increasingly unlikely in 2015," it said.

The report rated the Australian and global economies as neutral both for the current situation and the outlook for the next 12 months.

"Moderate global economic growth is expected in 2015, with a high degree of variability across countries and regions," it said.

Exchange rates were the only positive in the report but the outlook was moderated to neutral. The Australian dollar and other major currencies remain lower against the US dollar in year-on-year terms.

The Australian dollar is expected to stay at the current levels or lower into 2016.

The only disadvantage is that the lower world prices mean the gains from the lower dollar have not been as great.

◀vourable weather conditions, global milk supply growth had persisted, despite a depressed farmgate price outlook.

The New Zealand's drought has not had the impact on milk production that many envisaged; however a depressed farmgate price outlook may slow expansion there in 2015-16.

Despite margins dipping below the top tier of the US Margin Protection Program (MPP), most areas of the US continue to record strong growth in milk production, with the exception of drought-affected California.

The removal of European milk quotas has supported continued expansion in milk production, though buoyant supplies and the continued closure of the Russian market threaten margins in the months ahead.

Australian milk production continues to outperform forecasts, as favourable seasonal conditions and consecutive years of relative stability in margins support farmer confidence.

Australian growth is forecast to lead the key export markets — with a 2.5% jump forecast for 2014-15 compared with 0.5% for New Zealand and 1.2% for the European Union (for calendar year 2015) and 1.3% for the US (for calendar year 2015).

'Australian milk production continues to outperform forecasts, as favourable seasonal conditions and consecutive years of relative stability in margins support farmer confidence.'

Domestic market

There has been strong growth in food service (cafes, restaurants and takeaway food) and supermarket spending in the Australian domestic market, though lower six-month growth figures suggest the pace of growth has slowed in recent months for both.

The price of many dairy products is increasing relatively rapidly, with the dairy Consumer Price Index (CPI) increasing 2.5% in the year to March, compared with a 1.9% increase in the broader food and non-alcoholic beverages index.

Strength in the dairy CPI was largely influenced by continued robust growth in cheese (up 5.6%), while ice cream and other dairy products also grew strongly (up 2.9%). The milk subcomponent shrank 0.1%.

Supermarket sales of major dairy categories continue to tell an essentially positive story. Dairy spreads remain the top-performer, outpacing all other major dairy categories for both volume and value growth.

Milk sales are increasing slowly and steadily. Despite shrinking sales volumes, higher average per kilogram prices for both the cheese and yoghurt/dairy snacks categories are delivering continued growth value.

Growth in white (non-flavoured) milk has been largely supported by UHT. Sales of fresh milk grew 0.1% in volume for the 12 months to May, with a slight fall in the average price (-1c/L to $1.36/L) pushing category value down 0.6%.

UHT sales grew at a substantially faster pace, up 7.1% in volume, although a lower average price (-4c/L to $1.24/L) saw value grow more slowly (4.0%). D

Input costs key risk factor

Key points

- ✔ Tighter grain and hay markets possible
- ✔ Higher water prices
- ✔ Fertiliser prices lower with increased supply

THE key negative risk factor for the Australian dairy industry in the next 12 months is to input prices, according to Dairy Australia's *Situation and Outlook* report.

The report is forecasting a cost:price squeeze for the start of the 2015-16 season (see Figure 1), which would be exacerbated if a severe El Niño caused a feed shortage.

But the report said reasonable full-season profitability appears achievable, despite the pressure on prices and input costs.

The Bureau of Meteorology has declared an early stage El Niño. The report said while there was a lack of consensus from forecasters around the globe as to the extent and severity of the event, the significant impact that El Niño could have on grain and fodder production globally meant the announcement had been noted by the market.

Not every El Niño is associated with widespread drought, and the impact on the weather can vary widely. This variability in El Niño's impact makes the effect on production of pasture, grain and hay difficult to predict.

Grain and hay markets have responded to the forecast, with a gap opening between international benchmark, and firming domestic prices.

Hay prices remain unusually stable for the time of year. But stocks of hay in Western Australia, South Australia and Tasmania are relatively low, raising the prospect that prices could increase through winter.

The water market has also responded to the forecast and to low inflows into water storages, particularly in northern Victoria.

International benchmark urea prices remain lower than last year, and below average.

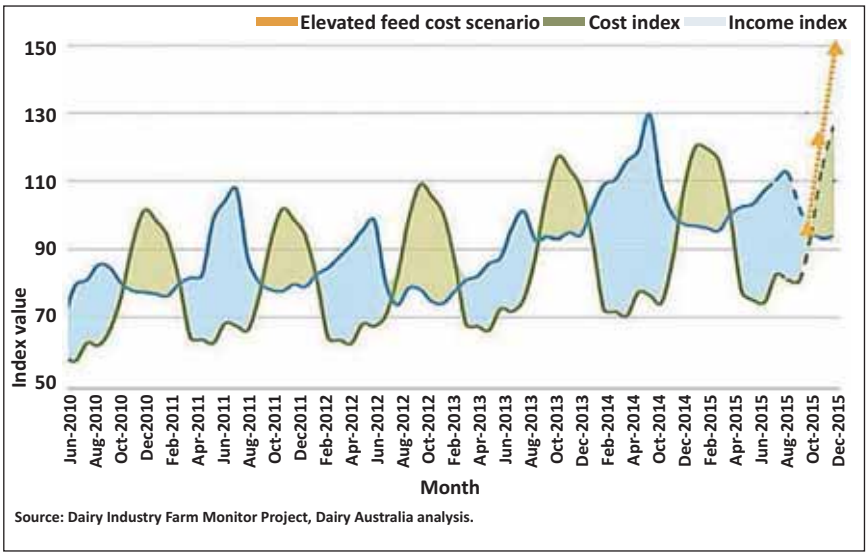
The report said dairy cattle exports were 2% behind last year (financial year-to-date, to March), at 60,552 head.

A significant fall in Chinese domestic milk prices has dampened demand for heifers.

While reduced demand has seen lower prices for dairy cattle for export, extremely strong demand for manufacturing beef out of the US has continued to support cull cow values.

It is possible that Australian producers are taking the opportunity to trade (now relatively cheap) heifers for older and less productive cows, as slaughter rates are well ahead of year-earlier levels.

Figure 1: Export Region Weighted Cost and Income Indices.



Source: Dairy Industry Farm Monitor Project, Dairy Australia analysis.

Profitable nitrogen fertiliser decisions

Key points

- ✔ Online nitrogen tool developed
- ✔ Measures how much N to apply for maximum profit
- ✔ More efficient use of fertiliser

By **Alexandra de Blas**

IN THE past two decades nitrogen (N) fertiliser use on Australian dairy farms has substantially increased and now costs the industry about $200 million a year. A new free online tool, based on world-leading research, will improve decision making around the application of N and make dairyfarming more profitable and productive.

The Dairy Nitrogen Fertiliser Advisor came out of the Dairy Nitrogen for Greater Profit Project, led by Dr Cameron Gourley, a senior research scientist at the Department of Economic Development, Jobs, Transport and Resources (DEDJTR) in partnership with the Gardiner Dairy Foundation.

Need for guidelines

"There was a need to provide better guidelines around how N fertiliser can be used to drive production and profitability," Dr Gourley said.

"Standard approaches had assumed that there was a linear relationship between the amount of extra dry matter you would get from applying additional kilograms of nitrogen, but we know that is biological and economic nonsense."

To develop the national calculator a multidisciplinary team pulled together results from about 6000 field experiments nationwide, creating a new national database of N fertiliser responses.

By drawing on information about the relationship between N application and pasture production in all the dairy regions of Australia in different seasons, they were able to describe the biological principle of diminishing returns — recognising that at some point there is less response for each extra kilo of N added.

World first

"We've now defined the relationship between nitrogen fertiliser and dry matter yields for different regions and seasons," Dr Gourley said. "It's exciting because it's the first time that's been done in Australia, and I understand it's the first time it's been done successfully for pastures anywhere in the world."

'One of the things Cameron demonstrated with this project is with nitrogen you either use it or you lose it.'

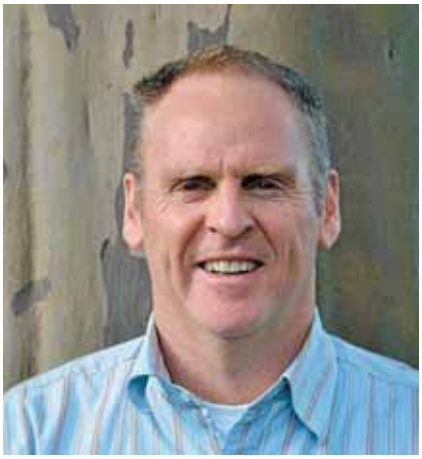
The N Advisor not only measures how much nitrogen should be applied for maximum profit, but for the first time it brings economics into the equation allowing farmers to find the best balance between outputs and inputs on their farm.

With the average farmer spending $30,000 on fertilisers each year (mostly nitrogen-based), it's easy to see the importance for profitability of getting that balance right.

The Gardiner Foundation was the primary industry partner, although the project was embraced by many of

Experimental field work on a commercial farm measuring different nitrogen fertiliser rates and the growth response to the extra fertiliser applied.

Farmers such as Brendan Rae, Allansford, Western Victoria, will have a new tool to help them calculate how much urea to apply to pastures.



Dr Cameron Gourley is the lead scientist behind the Dairy Nitrogen Fertiliser Advisor.

the major dairy and fertiliser companies.

This is a big change from the previous decision tools for nitrogen use, which relied on small experiments within a limited geography, and one that Incitec Pivot technical agronomist Lee Menhenett said had paid off.

Robust science

"The tool is based on the best science, so you'd be mad if you didn't use it," Mr Menhenett said. "It's a tool that you can have confidence in."

Dairy farm field services manager Mark Jago, from Murray Goulburn, agrees. "It's a great outcome to be able to use 50 years of N experiments, identify gaps, do some more trial work to get confident outcomes from that research work, then to take that and put it into a discussion support tool that a farmer can use with a consultant to get better outcomes for his N usage and N spend," he said.

The research team tested the tools predictions for 18 months on three dairy farms in different Victorian regions.

"This gave us the green light for translating the tool into something that farmers and fertiliser advisers could use to promote discussion in regular fertiliser planning," Dr Gourley said.

The tool online

The online tool is available at <http://vro.depi.vic.gov.au/dpi/vro/vrosite.nsf/pages/nitrogen-advisor>, or by Googling Dairy Nitrogen Fertiliser Advisor.

Despite the large amount of scientific information that supports the predictions, the online tool is easy-to-use, with only five simple inputs needed to attune the recommendations for a specific dairy pasture.

The tool allows the user to adjust the region, season, pre-grazing and post-grazing dry mass per hectare, nitrogen costs and fertiliser application rate.

This then produces a graph showing how different choices will influence production of dry matter per hectare and helps guide the user to the most efficient application rate.

Incorporating economics was important, and the framework was developed by leading agricultural economist Professor Bill Malcolm of DEDJTR and the University of Melbourne.

"It is designed to test the farmer's intuition especially under changing conditions," Prof Malcom said. "If urea prices go up, or feed and milk prices go up or down, it may be worth thinking about changing the amount of N you put on for the next grazing rotation.

"Does the 50th kilogram of N cost you more than it is worth or how much income does it add? If it costs you $1.30 to put it on, does it add $2 worth of income or $1."

Environmental benefits

There are other benefits to applying the most efficient amount of nitrogen fertiliser possible. Nutrient loss from farms has become a major environmental concern and is only likely to receive greater regulation and scrutiny in the future. This is particularly the case for nitrogen losses from dairy farms, where on average only 25% of nitrogen inputs end up in milk and animal products, with the rest being lost to the broader environment.

These loss pathways are complex, with excess nitrogen escaping to waterways and groundwater, and in the atmosphere as ammonia or nitrous oxide gases, causing major concerns for human health and climate change.

"One of the things Cameron demonstrated with this project is with nitrogen you either use it or you lose it," Mr Menhennet said.

"We've always known that nitrogen is volatile, and has many loss pathways, but the field studies have shown that if you use nitrogen profitably then by default you've captured it in the pasture, and if you've captured it in the pasture then you're a long way to capturing it in milk production."

Dr Gourley said the project paved the way for further work on understanding and improving the management of nitrogen within the whole dairy farm, for example, finding better ways to capture and use the nitrogen being lost through animal excretion.

"Dairy cows excrete around 80% of the dietary nitrogen they consume, so the greatest benefit will come from directing this excreted nitrogen into soil and pasture productivity on farm rather than losing it to the environment," he said.

Contact: website <www.gardinerfoundation.com.au>, phone (03) 8621 2900.

Nitrogen mindset must change

Key points

- ✔ Manage nitrogen use to get better response
- ✔ Ensure cows consume extra grass growth generated
- ✔ Try to apply nitrogen straight after grazing

By **Louise Preece**

ON THEIR notoriously wet dairy farm in South Gippsland, Tim and Grit Cashin often apply nitrogen generously in the hope that it will last a bit longer in the system — and trigger extra grass growth. In reality, much of that nitrogen might be not be used, and further losses could occur if it is not being applied straight after grazing.

It may well be a mindset other farmers in the region follow, but associate professor and director of the Primary Industries Climate Change Centre at Melbourne University Richard Eckard said Australian dairyfarmers needed to get out of this habit.

Speaking at a GippsDairy Focus Farm field day on the Cashins' leased property, he urged the crowd of 100 producers to change their mentality when it came to nitrogen use.

"I think what's happened across the years is that some people have started to apply more and more nitrogen, and they've become dependent on it," Mr Eckard said.

"They are also feeding out grain at the same time, when they should really be making sure the cows are eating the extra grass grown from the nitrogen."

Richard Eckard tells dairyfarmers the base fertility of their soil needs to be good to ensure the best response from nitrogen application.

He said dairyfarmers needed to plan carefully for the additional growth in the paddock and ensure that grass was consumed.

"Often what you will see is that farmers don't adjust their grazing management," he said. "They need to allocate cows to a smaller area to consume that extra grass."

Mr Eckard said the biggest issue with nitrogen was it was "slippery" — and could be lost easily to the environment.

"It can be lost as a gas … or it can run off with water," he said. "Probably only 30-40% is used by the cow."

But Mr Eckard had some useful

advice to help farmers change their mindset about nitrogen.

"If you put nitrogen in your feed budget, rather than your fertiliser budget, you will start to think about applying it in the right way," he said.

Farmers also needed to consider the fertility of their soils and pasture, when taking into account what response the nitrogen would have on their pasture.

"If your base fertility is good, you will capture a lot of the nitrogen, but if your soil fertility is lacking and you have a poor pasture composition, then you won't get much of a response," he said.

'If you put nitrogen in your feed budget, rather than your fertiliser budget, you will start to think about applying it in the right way.'

Once farmers have established the fertility of their soils, Mr Eckard the next thing to consider was the temperature.

"When you are trying to predict when to start nitrogen applications, look back at the season you've had," he said.

"If you've had a dry season, there will already be nitrogen in the soil. If it's been wet, there will be less nitrogen."

He said the main reason best practice guidelines recommended nitrogen be applied immediately after grazing was because once rapid regrowth began, that was the time the grass utilised nitrogen.

"If you delay 14 days in putting on your nitrogen, your response is decreased by 14%," he said.

Mr Eckard said he understood many farmers could not apply nitrogen straight after grazing, but they had to understand that putting on a lot of nitrogen two weeks after grazing would not have a powerful impact.

"This is the compromise you are making," he said. "Farmers need to know that the best time to put nitrogen on is straight after grazing … there is a small window."

After Mr Eckard's presentation, dairyfarmer Tim Cashin said his view about nitrogen use had changed.

At the time of the field day in late autumn, the Cashins' 270-head milking herd was on a 50-day. The herd produced about 529 kilograms of milk solids per cow per year, with 2.23 tonnes of grain fed out per cow per year.

Nitrogen use equated to 288kg per hectare, with 8.7t of dry matter consumed on-farm and roughly 10-11t grown. Mr Eckard advised this application rate was slightly high, considering how much dry matter was grown.

"I think we will try and be more flexible now," Mr Cashin said. "We often put on extra urea if it looks like it is going to be wet, because we thought it would stretch it out further, but that's just not the case.

"Instead — we might try to put on smaller amounts more often. Economically, this might cost us more, but I thought a good idea would be to go in with a neighbour, and share the truckload."

However, in reality, this practice might be easier said than done.

"When it's really wet, the truck can't physically get on the farm," he said. "But this is the trade-off we have to make. The longer you leave it, the bigger the losses will be."

And while the Cashins might be thinking differently about nitrogen now, he said they did try to make sure the herd was consuming the extra grass grown from nitrogen.

Grit and Tim Cashin do a good job of ensuring cows eat the extra grass produced from nitrogen but plan to improve their nitrogen application practices to ensure they get a better response.

"We do a reasonable job at this, and we strip graze," he said.

They had also made an investment into humping and hollowing the wet areas of their farm to decrease nitrogen run-off. D

Dairy Australia
Your Levy at Work

Supporting young leaders in agriculture

Key points

- ✔ Dairy Australia is proud to support the 2015 Global Youth-Ag Summit
- ✔ Inspiring and connecting future leaders in agriculture
- ✔ Focuses on sustainability, innovation and leadership

ONE hundred 18-25 year-olds from around the world will come together in Canberra from August 24-28 to share their thoughts on sustainable agriculture.

Dairy Australia's Legendairy program is proud to be a Gold Sponsor of the event, which will explore the crucial question: How can we feed the world's rapidly expanding population?

The world's population is growing at a rate of 233,000 people every day, with the United Nations predicting that it will hit nine billion by 2050.

Dairy Australia's group manager for industry promotion and product innovation, Isabel MacNeill, said sponsoring the 2015 Global Youth-Ag Summit was a perfect fit for Legendairy.

'Not only will we be able to promote the great aspects of the Australian dairy industry but we will learn how dairy is represented in other parts of the world.'

"The summit is a great opportunity for the dairy industry to celebrate and share how innovative and truly Legendairy it is," she said. "Not only will we be able to promote the great aspects of the Australian dairy industry but we will learn how dairy is represented in other parts of the world."

Ms MacNeill will speak at the summit to share the progress of Legendairy, detailing how the initiative has helped to increase positive perception of the industry and its people and products.

Legendairy ambassador Michael Klim will also be speaking at the summit. A three-time Olympian and successful businessman, Mr Klim will share his inspiring story and leaderships tips with the delegates.

The summit will focus on three areas: sustainability, innovation and leadership. Dairy Australia's program development manager in animal health and fertility, Erika Oakes, has had the privilege of being selected as one of the mentors for participants during the summit.

"I am looking forward to sharing the challenges we face in Australia and seeing how that compares to similar issues around the world," she said. "It is a great opportunity to showcase some of the innovative practices our dairyfarmers are implementing. It will also be great to meet future leaders across all agricultural sectors and boost their vision and ideas to help to feed our growing population."

The Youth Ag-Summit was first held in Canada in 2013. This year 100 delegates, from 33 countries, have been selected from a pool of 2000 applications.

For more information visit website <https://www.youthagsummit.com/home/>.

Dairy Australia
Your Levy at Work

Developing trade in Middle East

Key points

- ✔ Australia seeking FTA with Gulf Cooperation Council
- ✔ Dairy Australia part of trade mission
- ✔ Looking to also address technical barriers

DA managing director Ian Halliday (at right) visiting a Saudi Arabian milking shed facility with George and Michael from Al Marai.

ABOUT 11% of Australia's dairy produce heads to the Middle East region, which in 2013/14 was worth about $US337 million. With a growing consumer appetite, escalating international tourism patronage and strengthening diplomatic confidence, the Middle East is certainly a part of the world where Australian dairy could soon become a household name.

The most important specific markets for Australia's dairy exporters are the United Arab Emirates (UAE), Saudi Arabia and Kuwait.

The UAE is a significant end market in itself and also redistribution point for surrounding markets. Key dairy products imported into the region are cheese (especially cream cheese), milk powers, butter and yogurt.

A few weeks ago Dairy Australia's managing director Ian Halliday joined a senior trade delegation of 15 Australian company chief executive officers that was led by the Australian Minister for Trade, Andrew Robb, that visited Dubai, Abu Dhabi and Saudi Arabia.

These countries form a core part of the Gulf Co-operation Council (or GCC).

Negotiations between Australia and the GCC on a free trade agreement were suspended by the GCC in 2009 and the GCC now want to restart the discussions. However, there are eight countries, including Australia, that are vying to negotiate a FTA with the GCC. The council has indicated it wishes to negotiate only with two countries initially as it does not have the resources to do any more at an initial stage.

The purpose of the April trade mission was to demonstrate to the GCC group that Australia is keen to finalise a FTA and now has an enviable track record of successfully negotiating trade agreements — having completed FTAs in the past 15 months with South Korea, Japan and China.

Dairy Australia and the dairy industry generally is highly supportive of the government's endeavours to hasten negotiations towards a FTA between Australia and the GCC.

It also believes non-tariff barriers to trade (NTBs) — such as those relating to product age — have a significant existing impact on the cost of doing business into the region for Australian dairy, restrict the value and volume of dairy trade, and increase costs for dairy customers and consumers.

'Australian dairy's world-leading systems extend not just to food safety but also to critically important cultural and religious quality control.'

Last year Dairy Australia commissioned a comprehensive and expert review of how technical barriers to trade are adversely affecting exporters. The report found the aggregated impact of about 50 specific non-tariff barriers into key Middle East markets was costing the industry hundreds of millions.

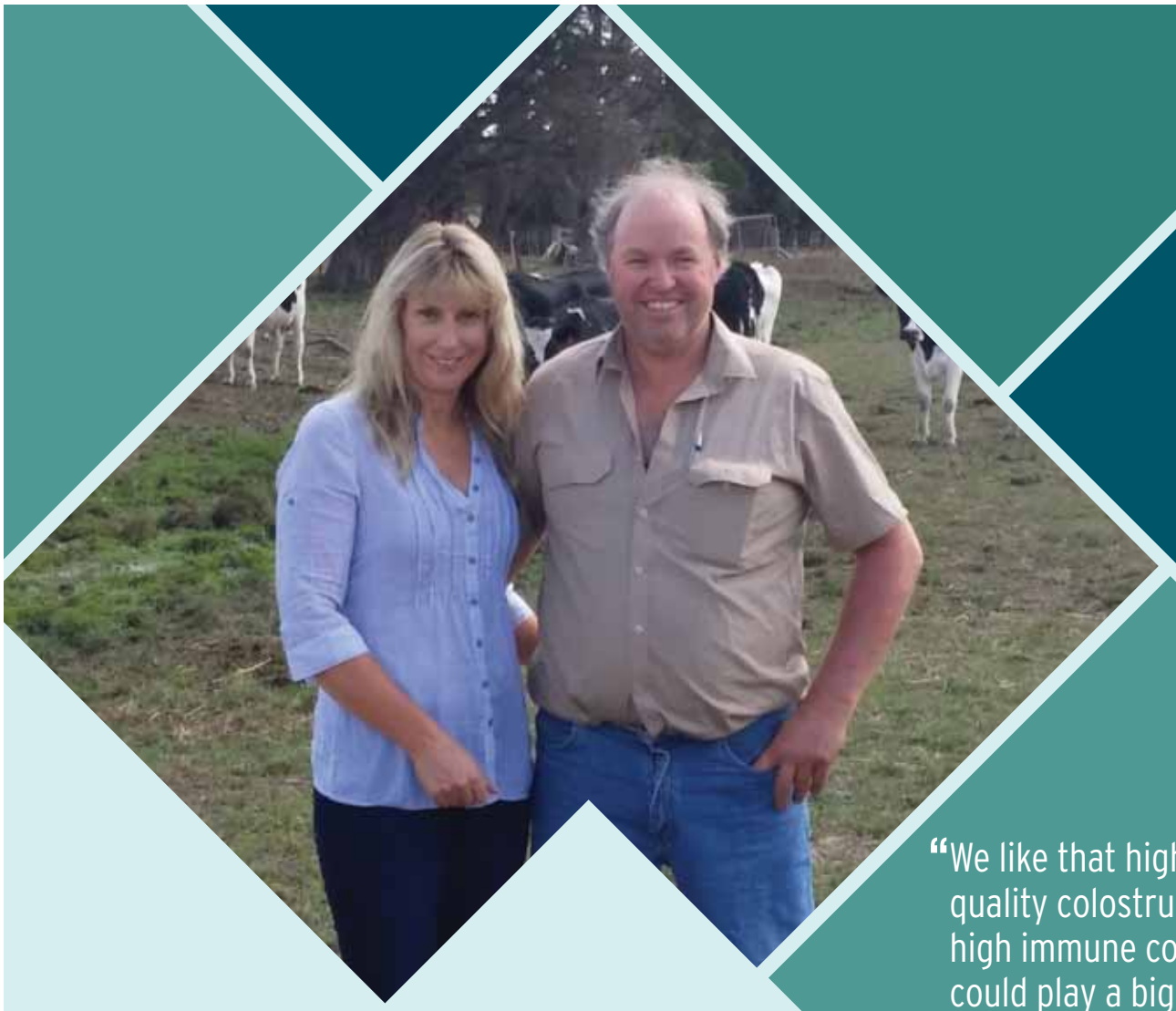
There is a tremendous opportunity in the immediate years to moderate some of these unnecessary technical barriers and increase the flow of dairy between Australia and the Middle East. So coupled with rebooted trade agreement dialogue, when it comes to dairy, the trade-access agenda for the Middle East is a dynamic one full of opportunity.

Australian dairy's world-leading systems extend not just to food safety but also to critically important cultural and religious quality control. Australian dairy shipped to the Middle East is halal certified, with traceability through the entire supply chain.

Competition for greater market access, however, will be fierce. Other suppliers, including the European Union and New Zealand, are keen to restart negotiations of their own trade agreements. The EU will also focus additional imports into the region now production quotas have been removed.

The agricultural and food production offer from Australia to the Middle East extends well beyond dairy. Australian seafood, table grapes, red meat and grains are all highly respected and sought after by local processors, restaurants, hotels and supermarkets.

There is a tremendous opportunity for the Australian dairy industry to work closely with its food production colleagues to effectively brand and promote Australia's natural goodness as being a huge part of the future in this most ancient and beautiful parts of the world. D



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Promoting dairy products and industry in a fun way

DAIRY Australia is producing a series of information graphics to help promote the Australian dairy industry.

DA's media manager Mark Pearce said the cartoon-style graphics were a fun way to illustrate the amazing scale of the work done by dairyfarmers and producers.

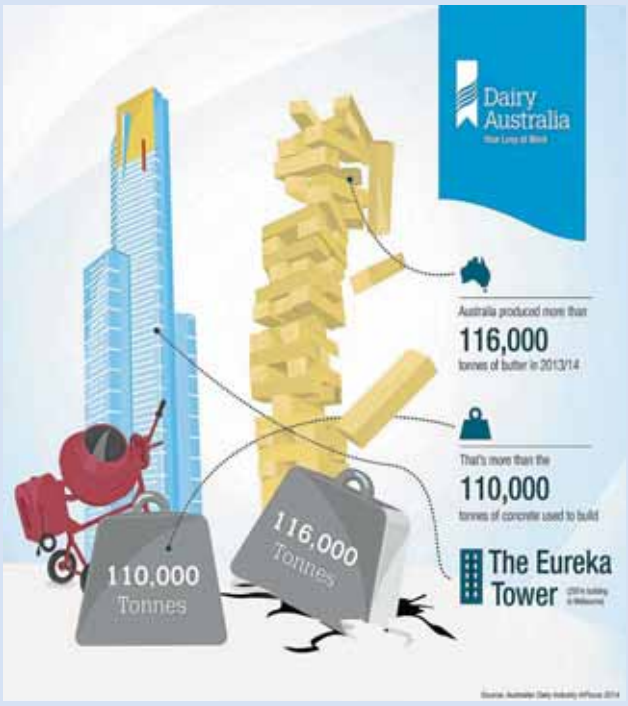
"The fun graphics are a way to communicate to a broad audience the scale and size of the Australian industry," he said.

"Bald facts are often incomprehensible, so to have an image or metaphor can help get a picture in the mind's eye.

"It's just a way we are trying to be creative with our data and do something a little different and hopefully amusing."

The graphics are being distributed to media outlets throughout Australia, as well as via social media, under the heading Friday Fun Facts.

An example of one of the information graphics.



The graphics are designed to show the scale of the dairy industry in Australia.

Dairy Australia
Your Levy at Work

Science shows more dairy needed

By **Dr Anita Lawrence nutrition science manager and Glenys Zucco consumer marketing and communications manager Dairy Australia**

Key points

- ✔ Statistics reveal Australians falling short in nutrient consumption
- ✔ Dairy able to fill dietary gap
- ✔ Industry working to promote dairy foods to consumers

WE hope everyone enjoyed reading our first column on the work Dairy Australia is doing to promote dairy health and nutrition to Australians, which appeared in the *Australian Dairyfarmer* March-April 2015 edition.

This time we will explore the first detailed information about Australia's nutrient intakes to be available in almost 20 years and what it means for messages about dairy foods.

For years, nutrition messages and policies in Australia have been based on the results from the 1995 National Nutrition Survey. This has become problematic as there has been little information available about how more recent changes in eating habits are affecting nutrient intakes.

The good news is that finally, the "information drought" has broken and in March 2015 the Australian Bureau of Statistics (ABS) released usual nutrient intake data from the 2011-12 National Nutrition and Physical Activity Survey. The survey was part of the larger Australian Healthy Survey. About 12,000 people were asked what they ate and drank, and researchers then calculated people's usual intake of various nutrients from a subset of 7500 participants. These large numbers provide us with some real insight into current eating habits and nutrient intakes.

What does this mean for dairy foods?

The most startling result is that more than half of Australians aged two years or above are not meeting their daily calcium requirements — and that calcium is the number one "nutrient of concern" in the Australian diet. However, just taking a calcium supplement will not fix the problem as other nutrients are also in short supply.

The accompanying graph (see next page) shows which nutrients Australians are missing out on.

'The most startling result is that more than half of Australians aged two years or above are not meeting their daily calcium requirements...'

Notice the nutrients labelled with ** — these are the ones found in dairy foods such as milk, cheese and yoghurt. In fact, dairy foods provide many of the nutrients that are in short supply in the Australian diet, such as calcium, vitamin A, riboflavin (vitamin B2), vitamin B6, iodine and magnesium for people of all ages, as well as phosphorus for girls, zinc for men and protein for elderly men.

With the 2011-12 survey highlighting that dairy foods continue to be the richest source of calcium in the Australian diet and that milk is the biggest supplier of vitamin B12, iodine, riboflavin (vitamin B2), phosphorus and potassium, increased intake of milk, cheese and yoghurt would help to address many of Australia's nutrient gaps.

This should not be a problem, as Australians love their dairy foods — on the day of the survey, 85% of participants consumed them. We just need to encourage them to have more milk, cheese and yoghurt.

Inadequate nutrient intakes were most common in teenage girls and women over the age of 50 years; for both groups, fewer than one in 10 individuals received enough calcium from their diets.

Many teenage girls and older women also had diets that were lacking in other dairy nutrients such as vitamin A, riboflavin (vitamin B2), vitamin B6, vitamin B12, iodine and magnesium.

Not only are milk, cheese and yoghurt important for bone development and strength but as highlighted in the Australian Dietary Guidelines they are also important for the prevention of heart disease, stroke and some cancers.

With six out of 10 adults and one in four children being overweight or obese, energy (kilojoule) intake needs to decline rather than increase.

So, how can we make room in the Australian diet for more milk, cheese and yoghurt?

The results of the survey help with this too as they highlight clearly that people need to cut down on discretionary (or junk) foods.

These foods provided lots of energy (more than one third of total energy) but few essential nutrients. The biggest culprits for adults were cakes, muffins and scones, sweet and savoury pastries, wine, beer, softdrinks, sweet biscuits, chocolate and chips/fries.

With these new findings, the dairy industry has an even stronger evidence base than before to encourage Australians to rebalance their diets by cutting down on junk foods and upping their intake of milk, cheese and yoghurt.

What are we doing about it?

Dairy Australia has long been communicating with specific audiences to help address nutrient shortfalls and to increase dairy consumption for general health and wellbeing — but we have had to base our messages on the results of the 1995 National Nutrition Survey.

The new findings will give them lots of extra credibility.

This data also acts as a strong evidence base in the nutrition policy work we are undertaking at Dairy ▶

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Australia, such as in discussions with policy stakeholders engaged in health promotion activities.

Our top priority is mums with primary-school-aged children.

It is particularly important to focus on this group because one in two upper-primary-school-level children are not getting enough calcium in their diet.

This is a key age to establish bone-healthy habits ready for adolescence, when bone development is at its peak. Meanwhile, mums themselves are also falling short; about seven out of 10 women aged 19 to 50 years are not meeting their daily requirements.

We need to offer this audience easy ways to get more dairy foods into their diets — and we are already addressing this through the Legendairy Start and End Your Day with Dairy message, which we are advertising through TV, magazines and outdoor billboards, among many other ways.

By starting and ending the day with dairy, people will be well on their way to meeting their recommended serves of dairy — and getting many of the important missing nutrients such as calcium.

Our other key audience — the over 50s — showed concerning nutrient shortfalls too.

For women over 50 years of age, the recommended daily serves of the dairy food group jumps from 2.5 to four serves. That is a big increase, and we are promoting the need to eat more milk, cheese and yogurt through advertising directly to consumers and through healthcare professionals.

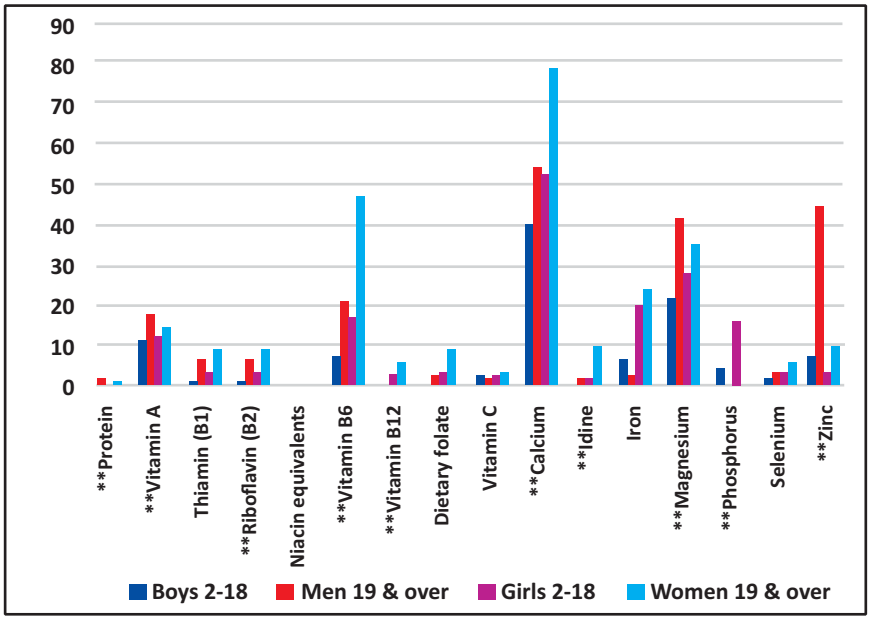
For young singles and couples — many of whom are physically active — we are promoting the message that milk is the perfect post-exercise recovery drink and we have new partnerships with gyms nationwide as well as a campaign with celebrity fitness coach Michelle Bridges to make this message more prominent.

Dairy foods are already part of the diet for most Australians.

The new usual nutrient intake results released by the ABS provide a stronger rationale than before as to why Australians should be having more dairy foods each day: not only do they taste good but they are also packed full of the nutrients we are likely to be missing out on.

For more information on how Dairy Australia is promoting dairy nationwide and tips for nutritious and delicious ways to start and end the family's day with dairy, visit: <www.legendairy.com.au/startandend>.

Figure 1: Proportion of the population with an inadequate intake of various nutrients.



Research shows dairy key to athletes' bone health

ATHLETES can improve their bone health by eating a dairy-based meal before exercising, new research has found.

The study, undertaken by the Australian Institute of Sport (AIS) in collaboration with Monash and Queensland universities and supported by Dairy Australia, involved 32 competitive cyclists and has prompted the AIS to recommend its athletes to incorporate dairy foods more strategically into their diets.

The study found that eating a dairy-based meal before cycling reduced bone breakdown during and after exercise, compared with the dairy-free breakfast trial.

AIS head of sports nutrition Professor Louise Burke said the pre-exercise calcium boost helped to counteract the loss of calcium in sweat and reduced the bone breakdown that would otherwise occur.

"This may help to preserve bone mineral density (BMD) in cyclists and reduce their risk of bone fractures and osteoporosis later in life," she said.

"High impact exercise like running stimulates bone growth, but athletes involved in non-weight bearing exercise, such as cycling, rowing and swimming, are vulnerable to low BMD. This can be exacerbated by losing calcium through sweat."

The AIS is suggesting that athletes have a 1000 milligram calcium boost, equivalent to three standard dairy serves, before exercising. The AIS is now sharing the research results with Australian cyclists and other athletes who experience non-weight-bearing exercise and large sweat losses, such as rowers.

In a separate piece of research, the AIS also examined the effect of high intakes of dairy on gut comfort and time trial performance in their cyclists.

"We find many athletes are concerned about the myth that eating dairy before exercise causes stomach upsets and will affect their performance," Professor Burke said.

"Before we went ahead with our recommendations about the bone benefits of dairy foods we wanted to test this assumption. We were delighted to find that even pushing the pre-ride meal to include the entire amount of the day's dairy intake guidelines had no detrimental effects on gut comfort or performance in cycling. So we feel confident about our recommendations around the various benefits of dairy before exercise."

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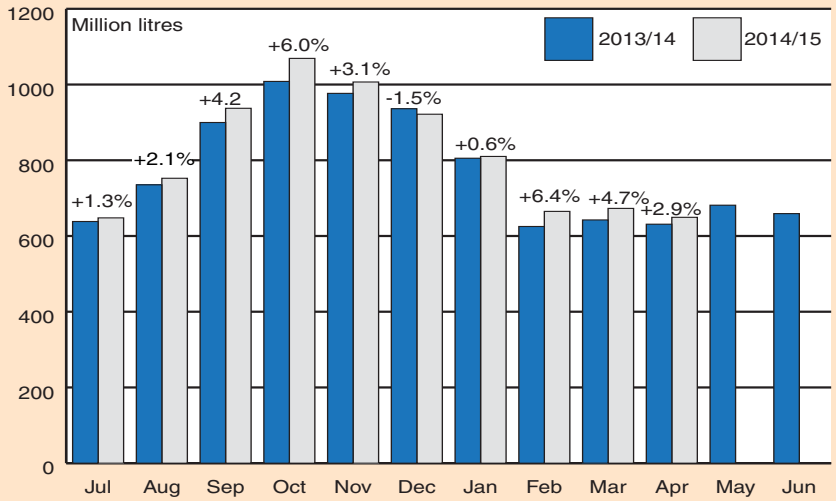
Domestic market shining light

By **Amy Bellhouse**
Analyst
Dairy Australia

Key points

- ✔ 74% of dairyfarmers positive about industry future
- ✔ 64% identified long-term benefits from Free Trade Agreements
- ✔ National milk production up 2.9% for year to April
- ✔ Growth in spending in food service and supermarket channels

Figure 1: Australian Milk Production by Month



DAIRY markets present a striking contrast from an Australian perspective. Internationally, prices remain depressed — the result of abundant supply and lacklustre demand. In Australia however, relatively stable production margins and favourable weather conditions have allowed farmers in many regions to consolidate, and even grow, their businesses. With milk processors publicly forecasting similar farmgate prices for the upcoming 2015/16 season, farmer confidence in the future of the industry remains high.

The results of Dairy Australia's 2015 National Dairy Farmer Survey (NDFS) indicate that 74% of dairyfarmers are feeling positive about the industry's future — in line with 2014 sentiment. Moreover, 79% of farmers anticipate a profit in the current season, while 41% have increased herd sizes and 52% increased milk production, implying yield gains have also played a part.

Positive sentiment is translating to investment on farm: 52% of respondents indicated intentions to invest in their enterprises in the next 12 months. More broadly, 64% of those surveyed identified long-term benefits to the industry as a whole from the recently concluded Free Trade Agreements with Korea, Japan and China.

Significant regional differences in sentiment remain; with confidence in the Subtropical Dairy region of Queensland and northern NSW still well below the national average at 55%.

However, a substantial increase has been recorded (from 31% in 2013), based on a slightly improved farmgate pricing and procurement environment, and supported by greater external investment interest in the region. In western Victoria and South Australia, confidence has been dampened (down 8% and 16% respectively) by uncertainty around recent corporate developments and the medium-term milk price outlook.

Relatively stable production margins and favourable weather conditions have allowed farmers in many dairy regions to consolidate, and even grow, their businesses during the 2014/15 season.

Australian milk production has tracked ahead of expectations, with national production up 2.9% for the year July to April. The strongest growth continues to come from Tasmania (+11.0%), followed by Western Australia, NSW and Victoria (at 4.9%, 4.7%, and 2.3% respectively), while difficult seasons in SA and Queensland have resulted in production falling -0.2% and -5.9%. Dairy Australia's revised forecast for 2014/15 anticipates about 2.5% full season growth (compared with 0.4% in 2013/14), with total production in the range of 9.45 to 9.50 billion litres now likely.

Farmers in a number of regions, with two good seasons behind them, are well-placed to take advantage of the opportunities a third could provide. If publicly reported processor milk price forecasts are realised and El Niño impacts remain moderate, further production growth is likely in the southern states through 2015/16. WA is likely to see more milk change hands as processors adjust their strategies, while Queensland searches for stability in the face of severe ongoing cost and climatic pressures.

Having a diverse range of markets and products has paid dividends for Australian exporters this season, and the more stable returns generated by the Australian domestic market (which consumes about 60% of milk production) have helped cushion the industry through an internationally volatile 2014/15.

Domestic dairy demand remains steady, with the most recent update to Dairy Australia's Food Service Index showing strong growth in spending through the food service and supermarket channels. Australian supermarket sales of major dairy categories continue to tell an essentially positive story. Dairy spreads remain the top performer, outpacing all other major dairy categories for volume and value growth.

Further detail regarding supermarket sales, and detailed regional results from the National Dairy Farmer Survey (NDFS) form part of the comprehensive market analysis and outlook in Dairy Australia's latest *Situation and Outlook* report, available now from website <www.dairyaustralia.com.au>.

Contact: Amy Bellhouse, email <abellhouse@dairyaustralia.com.au>.

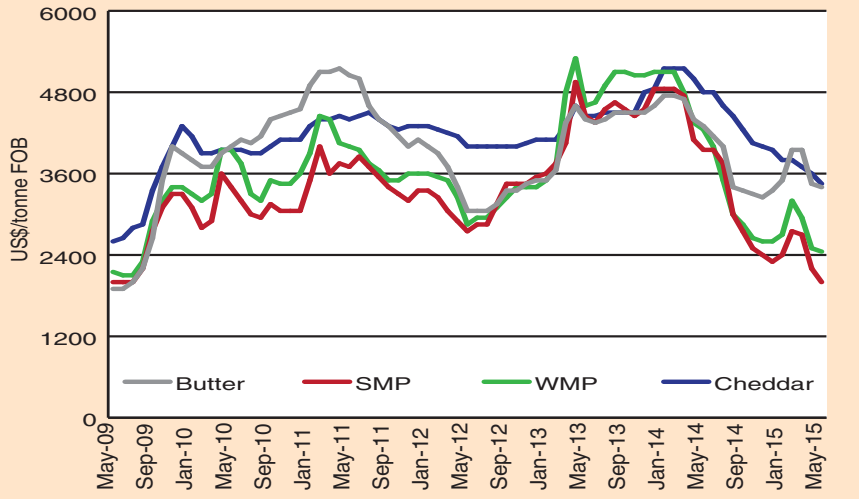
International market remains bearish

By **John Droppert**
Analyst
Dairy Australia

Key points

- ✔ International commodity markets remain depressed
- ✔ Resulting lower farmgate prices will eventually curb growth
- ✔ As milk production slows, the market will rebalance

Figure 1: Global dairy commodity prices



FROM a seller's perspective, 'no news' is currently 'bad news' on international dairy commodity markets, with little to shake prices clear of the current trough. Supply remains more than adequate to cover buyer requirements, and the momentum driving milk production growth (particularly in Europe) is likely to further delay any meaningful recovery.

Many buyers are well stocked, and unable to take further advantage of current prices, with double-digit volume growth in exports to South East Asia, Mexico and the Middle East beginning to moderate. South East Asian buyers, especially in Singapore (for blending and re-export), have been keeping whole milk powder (WMP) volumes ticking over as Chinese buyers remain relatively quiet.

Africa continues to absorb European WMP, though Algeria's state buyer ONIL says it is stocked "to the end of 2015". Japan has been a bright spot, with dairy imports for the 12 months to February 2015 the highest since 2007.

A firm domestic market is, in combination with California's drought, forestalling further growth in US exports, while global trade with Russia remains hamstrung by the embargo on key suppliers. Despite some Greek companies recently regaining access, Russia's ban is increasingly expected to outlast the initially announced 12-month term, with further exceptions for selected countries.

The expected year-on-year slowdown in European milk production (partly to minimise quota-related penalties) occurred earlier this year, as the aggregate EU-28 total slowed 0.2% for 2015 to February.

February was down 0.5% (with significant falls for a number of member states — particularly Ireland), compared with the same period in 2014.

Quotas were removed with much fanfare at the end of March, and since then, milk production has rebounded. Though anecdotal reports vary as to the extent of the supply response, spot milk prices (for post-farmgate trade) are trending downwards — suggesting a growing volume of milk that is surplus to processing requirements. A number of major processors are already passing on lower returns from this excess milk by reducing farmgate prices.

Across the Atlantic, the latest figures from the US Department of Agriculture (USDA) show US milk production grew 1.8% for 2015 to April and 1.7% for April, compared with the same periods in 2014.

The difference is stark, however, between California (down 2.1% for April) and the Midwest (where Wisconsin is up 4%, compared with April 2014).

To some extent, this reflects the extremes of 2014 as much as 2015: the Midwest suffered through the 'polar vortex' while California and other south-western states exhibited strong growth. Things are different now. Almost half of California is classified as being in 'exceptional drought', and substantial relief will only be seen if there is sufficient winter snowfall to replenish water reservoirs next spring (March-May 2016). In the Midwest and north-eastern states, excellent pasture and crop-growing conditions mean "the milk is flowing easily", according to local sources.

Margins are tightening as global fundamentals catch up with the US domestic market, however, and production forecasts from the USDA indicate a continued slowdown. The full year 2015 production total is now anticipated to come in 1% above the 2014 volume of 93.5 billion litres.

Favourable autumn conditions in many regions of New Zealand, particularly in the North Island, are expected to boost 2014/15 milk production just above the record 2013/14 season. Drought conditions have had localised effects, but overall this has not matched earlier, dire predictions.

Having started the year at NZ$7/kilograms milk solids (MS) (about A$6.94/kg MS), regular trimming has Fonterra's farmgate milk price forecast at NZ$4.40/kg MS (A$4.36) — similar to most other processors. For the 2015/16 season, Fonterra has forecast NZ$5.25/kg MS (A$5.21) — which is likely to place significant cash-flow strain on a large proportion of New Zealand's milk production base.

International market fundamentals remain bearish and are likely to continue to in the short-term. A depressed milk price outlook in Europe and New Zealand may go some way to restoring the global supply/demand balance, however the approaching Oceania spring is still seen as a significant impediment to that end. D

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Winning way on three farms

Key points

- ✔ Management systems produce winning formula
- ✔ Pasture management key to low cost of production
- ✔ Crossbred herd efficient pasture harvesters

Jill and Bill Chilvers, Lesley Irvine, from the Tasmanian Institute of Agriculture, and Grant and Kim Archer at the field day held on the winning farm in April.

FOR THE third-time winner of the annual ANZ Tasmanian Dairy Business of the Year (DBOY), Grant Archer it is a case of "have cows will travel". Grant and Kim Archer are joint winners of this year's DBOY, with Bill and Jill Chilvers, of Oakdene, at Symmons Plains. The Archers also won the Fonterra Share Dairy Farmer of the Year award.

The two couples entered into a 50:50 sharefarming arrangement milking 990 cows four years ago as the Chilvers sought to diversify from a cropping base on Okedene.

"The advantage for us is that we got to build up our cow numbers and equity and use that equity to buy some land ourselves," Mr Archer said.

Having won the award, the Chilvers and Archers are parting company. The Archers have bought land at Liffey, where they'll set up a new 1000-cow farm, while the Chilvers will operate the dairy farm.

The partnership was also of benefit to the Chilvers. "Bill didn't have any dairy expertise at all," Mr Archer said.

The first time the Archers won the award was for their own farm, at Mella, Tas, which they had bought from Mr Archer's parents. They moved to Longford in 2007 so their children could go to school at Launceston. They put a sharefarmer onto the Mella farm.

The Archers knew Rob and Jo Bradley, who are related to the Chilvers family, and were managing a property at Cressy, which had an un-used dairy. The Archers established a 50:50 sharefarming arrangement with the Bradleys and started milking cows on the

property in 2008. They won the Tasmanian and Australian Dairy Business of the Year Awards with this farming operation in 2012.

Before converting to dairy, the Chilvers carried out 10 years of cropping at 1600 hectares Okedene, while putting in centre pivot irrigation and water storage. The dairy conversion cost $1.3 million. The first milking season was 2011/12 and 870 cows were milked on the 243ha milking platform, of which 225ha was irrigated.

Management systems

Mr Archer put the win down to his management systems, based on high stocking rates and grazing improved pastures.

The leaf stage of pasture is monitored regularly. The Archers aimed to ensure cows are grazing ryegrass as closely as possible to the three-leaf stage for most of the year, dropping to the two-leaf stage in spring.

The rotation is planned to ensure each paddock is grazed to 1600 kilograms dry matter a hectare (DM/ha), with extra animals being put on if the target is not reached.

Pasture management has evolved from a 12-hour grazing system (where cows are given a fresh break after each milking) to multiple grazings in the one area. This type of grazing system has developed because the farms where the Archers have been share-farming are a combination of cropping and dairy.

For ease of cropping, the paddocks were left larger than those on a typical dairy farm; substantially larger paddocks increase the time taken to set-up temporary fencing and using temporary fences with centre pivot irrigation can be a nuisance.

The Archers trialled allowing the cows into the whole paddock for multiple grazings and found it a viable practice. Any silage is fed on the first day and the cows keep on returning ▶

Table 1: Key Performance Indicators for Oakdene compared with average for all benchmarking participants in 2013-14.

	2011-12	2012-13	2013-14	*Av. 2013-14*
Milking area, ha	258	256	290	*183*
Dairy run-off, ha	0	35	0	*74*
Effective area, ha	258	291	290	*257*
Milksolids, kg	352,219	402,597	436,510	*220,157*
Peak cows milked	870	940	990	*508*
Milksolids/Mha, kg	1364	1573	1505	*1206*
Milksolids/cow, kg	405	428	441	*422*
Feed conversion efficiency, g MS/ kg DM	86	92	92	*73*
Stocking rate, cows/Mha	3.4	3.7	3.4	*2.8*
Pasture consumption, t DM/Mha	10.6	11.9	10.4	*9.2*
Grazed pasture per cow, t DM	2.7	3.2	3.0	*3.7*
Grain per cow, t DM	1.3	1.2	1.3	*1.3*
Hay, silage & other feed per cow, t DM	0.7	0.2	0.5	*0.8*
Total feed per cow, t DM	4.7	4.6	4.8	*5.8*

◀ to the paddock until the target grazing residual is reached. With this grazing system, milk fluctuates on a daily basis but overall milk production has not been affected.

Having the right stocking rate and calving dates ensured the farm reached its full potential.

The system allows cows to be fed cheaply, through all seasons, with a low cost of production of between $3.50 and $4/kg.

As 50:50 share farmers, the Archers are responsible for employing the whole team involved in the dairy enterprise at Oakdene. They employ four full-time team members, one of whom is a manager, and employ casuals who assist with milking on weekends and when other team members are on holiday.

In 2013/14, the manager was Steven Saltmarsh, who has worked with the Archers for six years, including managing the Cressy dairy farm. The Archers have established workplace health and safety policies including an induction process for new team members.

They have also recently implemented twice-annual reviews with staff, conducted by an outside party, to get feedback on how everyone feels about their own involvement in the business, how effectively everyone is working together and ideas for improvement.

Crossbred herd

The farm runs a crossbreed herd. The Archers have bred their cows to be efficient pasture harvesters — pasture being the most cost-effective feed. They target a mature cow liveweight of 450kg. In 2013/14 per cow production was 441kg milk solids. A 3-in-2 milking routine (three milkings in two days) is practised on this farm for two-thirds of the year.

Cows are milked twice-a-day during peak milk production through to the end of artificial insemination, before switching to the fewer milking system.

Joint winners of this year's Tasmanian Dairy Business of the Year Jill and Bill Chilvers and Grant Archer.

'The award win was "a bit of a tick" for dairy farms in the Midlands.'

Mr Chilvers said the award win was "a bit of a tick" for dairy farms in the Midlands.

"A lot of it is to do with sharefarming with Grant, a high stocking rate and keeping it to the basics," Mr Chilvers said.

Sharefarming, common 20 years ago, had fallen out of favour with managers now employed on properties, he said.

"We didn't have any dairy experience and it was a good way for us to get into it, giving us the confidence to go out on our own," Mr Chilvers said. "It's very much a way to gain equity for both parties, it's a means to an end."

The success of Okedene was positive for the future of dairying in the Midlands, as the project had initially met with scepticism. While there would not be "wall-to-wall" dairy, alongside the Midland Highway, there was significant scope for expansion of the industry in the region.

"We know there is nothing wrong with the farm, we know it can produce and we won't be running an operation vastly different from the one we are now," Mr Chilvers said.

There has been some discussion about the the impact on the environment of dairying in this non-traditional dairy region.

The Chilvers have been taking part in Dairy Australia funded monitoring program to study the impact on underground water quality brought about by the introduction of a dairy farm to the property. Bill Cotching, soil management consultant, presented the results of this study at a field day held at the farm in April, which showed no long-term changes in the water quality since the dairy conversion. This has been achieved by good management of fertiliser applications and regular monitoring of soil fertility levels on a paddock basis.

Other winners of the Tasmanian Dairy Awards included King Island farmers Gary and Helen Strickland for the Environmental Award. The Safety Award went to Clovelly Dairy in Bridport and the Young Farmer Encouragement Award, a new award this year, went to Joe Hammond, from Legana. D

Table 2: Income and costs per kilogram of milksolids for Oakdene (with comparison to average for all benchmarking participants in 2013-14).

$/kg MS	2011-12	2012-13	2013-14	Av. 2013-14
Milk income (net)	$5.84	$5.00	$6.90	*$6.88*
Total Income	$6.84	$5.45	$7.61	*$7.52*
Total Herd & Shed Costs	$0.35	$0.39	$0.36	*$0.50*
Total Feed Costs	$2.21	$2.49	$2.39	*$2.56*
Total Variable Costs	$2.56	$2.88	$2.75	*$3.06*
Total Overhead Costs	$1.04	$0.98	$0.89	*$1.32*
Total Costs	$3.73	$4.03	$3.79	*$5.09*
EBIT	$3.11	$1.41	$3.81	*$2.43*
EBIT/Mha	$4239	$2223	$5738	*$2969*
Return on Assets Managed	15.2%	7.8%	20.6%	*13.7%*

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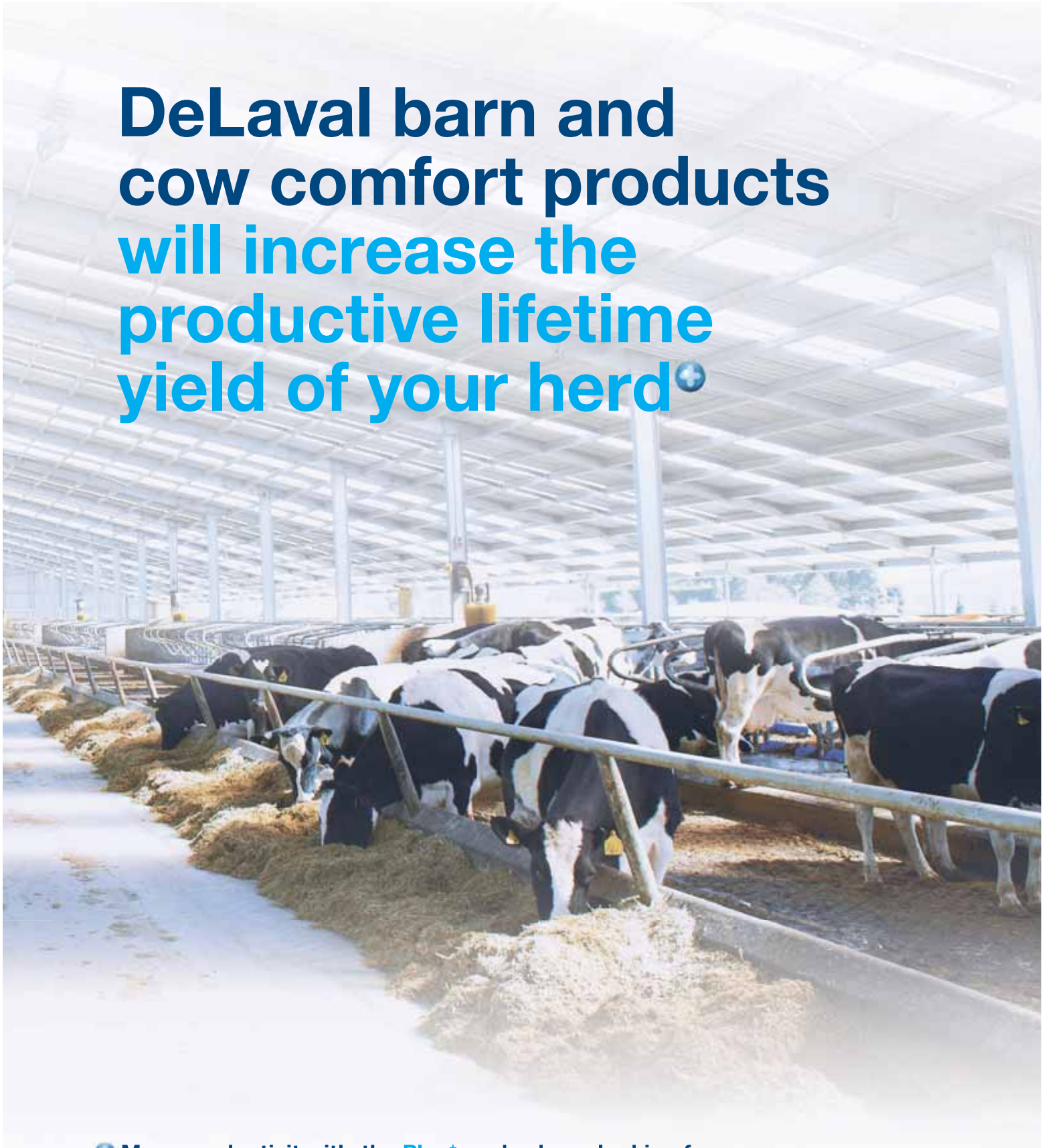

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A journey of business growth

Key points

- ✔ Aim to maximise profit without compromising long-term sustainability
- ✔ Simple, flexible pasture-based feed system
- ✔ Three-way crossbred cows for high fertility

THIS year's Dairy Research Foundation's symposium was held at Camden, NSW in June with the theme of Growing Dairy Businesses.

Ruth Kydd, from Finley in southern NSW, spoke to delegates about her family's 30-year journey in expanding their dairy business.

Their experiences highlight some important ingredients to successful business growth: preparation, attention to detail, flexibility, doing the sums, determination and valuing people.

Neville and Ruth Kydd and their sons, Daniel and Steven, and their wives, Vanessa and Kerryanne, milk 1260 cows at Blighty, NSW.

Their crossbred cows average about 500 kilograms solids/cow and seven million litres/year in a pasture-based system with 1.3 tonnes grain fed per cow.

They've come a long way since the early 1980s when Neville was an apprentice and Ruth a nurse, milking on her days off.

The Kydds sharefarmed before buying their first farm in 1985.

"We couldn't afford to buy in Gippsland so we moved away from our family to somewhere we could 'nearly afford'," Ruth said.

"We purchased a rundown irrigation farm at Finley with 40% equity.

"We could see that the farm had potential to allow us to grow the business. We dreamed of milking 250 cows doing 250kg of fat/cow."

Current production is seven times their starting production. Ruth acknowledges that production per cow is not high, but it is profitable.

"Our aim is to make an overall profit, to maximise the difference between milk price and expenditure without compromising our long-term sustainability," she said.

This focus on profitability has a strong influence on the Kydds' farming system, particularly breeding and feeding.

They run a seasonal calving, three-way crossbred herd. "The cows cope well with the distances they have to walk and are a hardy and economical cow for our farm; the animals are not too heavy on the clay-based soils, have low cell counts and high fertility," she said.

The Kydds have bred for high fertility, easy-calving, low cell counts, easy milking and good temperament.

"Breed is not important to us," Ruth said.

"Maintaining premium quality milk throughout the year is critical. The three-way crossing gives us the benefit of the hybrid vigour and a simple breeding system."

Being prepared and flexible

Across the years the Kydds have learnt they need to be prepared and flexible to deal with challenges that are out of their control such as droughts, floods, interest rates and changing government policy.

Mrs Kydd said that while pasture was the key to their system, the family had developed a flexible feeding system to cope with increasing seasonal variability.

"We like to keep at least 12 months-worth of silage stored on the farm so that we don't have to purchase feed at high prices," she said.

"We know storing silage comes at a cost but it gives us the confidence to plan ahead and removes the risk of having to purchase feed when it is simply not profitable."

With an average of 425 millimetre rainfall, the Kydds' irrigation scheme has a big impact on their feed costs.

"Our allocation is decided on an annual basis, and if it doesn't rain in the mountains we don't have water," Ruth said. ▶

The Kydds always had clear goals for their business, as this article in *Australian Dairyfarmer* in 1989 outlined.

Table 1: The Kydds' 30-year journey of growth.

Year	Milestone
1985	Purchased Avonmore, Finley, NSW, 217ha 40% equity, 167 cows
1990	Purchased Part Mandalay 44ha
1993	Built rotary dairy
1994	330 cows, 153ha (effective milking area); stocking rate 2.15 cows/ha
1995	Installed deep bore
2000	Purchased Yarrindale 79ha
	670 cows, 170ha (effective milking area); stocking rate 3.94 cows/ha
2002	100% equity
2004	Purchased Kia-Ora 217ha
2006	Purchased Little Myrtle Park 115ha
2007	965 cows, 353ha (effective milking area); stocking rate 2.73 cows/ha
2008	730 cows, 371ha (effective milking area); stocking rate 1.97 cows/ha
2011	100% equity; 1000 cows, stocking rate 2.85 cows/ha
2011	Purchased St Michaels 221ha
2015	Building second dairy at Myrtle Park
	1265 cows; stocking rate 3.4 cows/ha

Vipor

Nowell Viper

Type & Components

Sire: Kaarmona Valerian
Dam: **Nowell Power Sandy - ET SUP92**
305D 7593M 4.4% 336F 3.8% 291P
MGS: Claydon Park Flower Power
MGD: **Nowell Taranak Sandy - ET VHC90**
305D 7726M 4.4% 337F 3.6% 275P

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- Vipor offers fantastic Type +106 with good Production, positive Components and transmits outstanding farmer Workabilities.
- His dam; "Nowell Power Sandy – ET SUP92" is an incredible cow from a strong maternal line, she is 17 out 18 generations VHC or better. She has claimed championships at shows and On Farm Challenge Competitions and has over 10 sons in AI.
- Vipor is a full brother to the No.1 Australian BPI Jersey Sire; Raceway.

Dam: Nowell Power Sandy - ET SUP92

GGDam: Rye Valley Admiral Sandra 2 - EX92

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The Kydds have developed a flexible feeding system to cope with increasing seasonal variability.

Having a high fertility rate has allowed the Kydds to rebuild numbers quickly when seasons permit.

The Kydds with some of their team: (from left) Pedro Da Silva, Maeum Han, Chun Hua Lo, Ruth Kydd, Daniel Kydd and Steven Kydd.

"We need to be flexible to manage such a volatile commodity."

Figure 1 shows historical water allocations for the farm in the past 20 years.

The Kydds are not particular about how many cows they milk. If the sums don't add up they sell cows or choose to take a production cut to achieve long-term viability. Having a high fertility rate allows them to rebuild numbers quickly when seasons permit. For example in the millennium drought, they cut back from 1000 cows to 700 and built back up again when conditions were more favourable

Doing the sums

The Kydds do lots of mini budgets to analysis the cost/benefit of each decision, full budgets on big decisions and an annual financial analysis. They have been completing a comprehensive annual analysis since 1994 so they can compare their performance from year-to-year and to monitor for any emerging trends.

"Brian Crockart analysed our data for the Future Ready Farms project and Peter Havrlant has updated the info for the last few years," Ruth said.

"Benchmarking gives us a good comparison of how we are going compared to ourselves, but it is retrospective; budgets are used for looking forward."

Neville and Ruth also did an Australian Institute of Management course in 1996.

"This gave us a better view of our business and taught us that if we want something to happen we have to make it happen," she said.

"If we want to be profitable it's up to us to make it happen. We have to learn the skills, do the research and analyse the figures on every part of our business to make it profitable."

Future growth

The Kydds are in the process of building a new dairy on their Myrtle Park property, a separate farm to the main dairy.

"We are concerned that the stocking rate is getting too high on the dairy farm and that it is putting too much pressure on the cowshed, laneways, cows and staff. It makes us vulnerable," Ruth said.

They also recognise that to get a good return on the money they have invested in developing the property, they need to get a better return than just grazing and fodder production.

"We are hoping to build an economical dairy, which will pay for itself in five years," she said.

"With the insecurity in the water market we need to make sure we don't over capitalise our investment and ensure that we have options if we can't secure enough water to run the farm as a dairy farm."

People

In addition to the family members (Neville, Ruth and their sons, Daniel and Steven), the business employs three full-time and two part-time staff. Contractors are used for silage making, some fertiliser application, weed spraying and land forming.

"Steven is a mechanic so he does all the machinery work on the farm and a lot of the tractor work," Ruth said.

"Daniel focuses on the cows and pasture management. Staff are mostly backpackers or agriculture trainees wanting to gain experience.

"We try and fit the job to the person. We start them off with milking and then give them more responsibility as they prove their interest and skills. We encourage our staff to do any training they want and we attend most industry initiatives in our region."

Ruth said the family also recognised the value of relationships with their suppliers and other dairyfarmers.

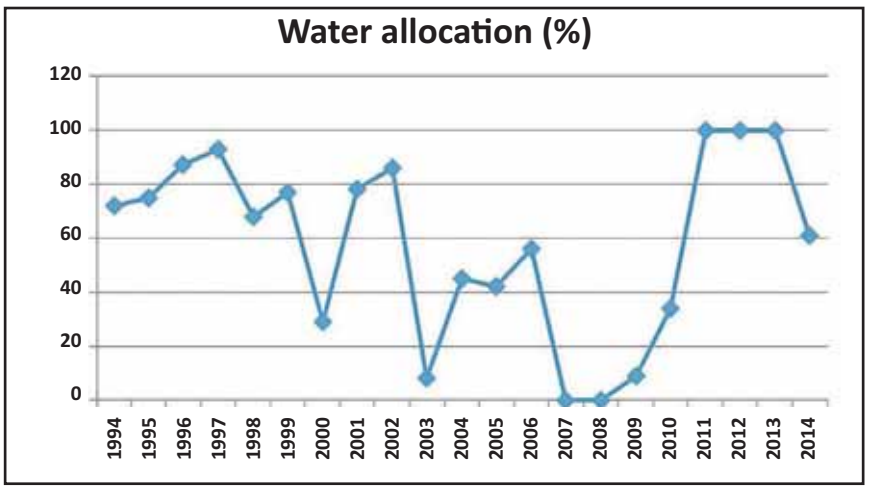
"Their support, understanding and commitment to our business helps us to be successful and in-turn we hope that they will be successful," she said.

"We also have many dynamic dairyfarmers in the area that support each other, all operating different businesses but sharing knowledge for the betterment of the industry.

"Living at Finley has many challenges but it has allowed us to grow our business so we can have our sons and their families work with us on the farm and to live the lifestyle we choose."

Contact: Dairy Research Foundation, Associate Professor Kendra Kerrisk, mobile 0428 101 372, email <kendra.kerrisk@sydney.edu.au>.

Figure 1: Kydd family farm water allocation in past 20 years.



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Sharefarming creates win:win situation

Key points

- ✔ Couple invest in developing farm
- ✔ Opportunity on family farm created dilemma
- ✔ Sharefarming offered win:win solution

By **Frank Smith**

Jeremy Atkin: We are better off now than when working two full-time jobs.

WESTERN Australian dairyfarmers Andrew and Claire Jenkins have entered into a sharefarming venture to grow their business and for their former employees and now business partners, Jeremy and Kadee Atkins, to growth their wealth via dairyfarming.

They told their story to Western Dairy's Dairy Innovation Day earlier this year.

Andrew and Claire Jenkins completed a Bachelor of Business in Agriculture and initially returned to work with Claire's parents Rob and Ruth Poole on their family dairy farm Yelverton, near Busselton in the South West of Western Australia.

They worked together for four years building up equity in cows and investing in a run-off block of land with the Pooles. However, their eventual aim was to own their own property.

The opportunity came in 2007 when they found a 290-hectare property about 10 kilometres from Denmark on the Western Australian South Coast with plenty of water and a seven-year old rotary dairy that had only been used for two years.

"We were attracted because the land was cheaper, we could take advantage of the opportunity to renovate existing dairy infrastructure and the south coast offers a reliable climate with opportunities for long-term expansion," Mr Jenkins said.

They bought this and established Valdana Holsteins in 2008, putting a Yelverton run-off block on the market to finance the purchase.

Initially they started with 150 cows and heifers but soon leased additional land to create a three million litre, 350-cow farm by 2013, making 800 cows in total (with the Yelverton herd), aiming for seven million litres in 2014/15.

By then nine people were involved in the business (all under 36) as owners or employees, with six of them graduates of Denmark Agricultural College.

Meanwhile the Jenkins had been breeding themselves with two children and a third on the way. There was also the need to plan for family business succession as the Pooles neared retiring age. They needed to build up their equity for this event and were both passionate about dairyfarming and breeding good dairy cows.

In 2013 the Jenkins appointed Jeremy Atkin as assistant manager at Denmark, promoting him to manager the following year.

> ***'We saw it as an opportunity to be involved in the industry on a higher level and knew it would be one heck of a challenge.'***

Mr Atkin hails from Jerramungup, some 220km east of Denmark; he had no background in dairying nor cash to contribute. After graduating from Denmark Agricultural College he managed the college dairy for seven years and did six years of casual/relief work when not working at the college before going to work for the Jenkins.

His wife, Kadie Atkin, has a background in veterinary nursing. The couple married last year and are not currently planning a family.

"I don't want to lose my second milker and chief calf rearer," Mr Atkin said.

The Atkins share the Jenkinses' passion for dairying and for breeding good dairy cows. Their need was to start wealth creation with the eventual aim of owning their own land.

Last year the Jenkins had the opportunity to return to Yelverton as the Pooles decided it was time to retire. But the Jenkinses didn't want to give up the Denmark farm.

"We'd spent nearly five years living in a shed, survived the Challenge receivership and built our new house and moved in," Mr Jenkins said.

"We'd spent six years of blood sweat and tears on Denmark. We were not going to just shut down this vision.

"We had to ask ourselves, were we growing our business responsibly by buying more cows and leasing a farm; while retaining our starter business?

"We needed both farms to become and remain viable."

After much discussion, soul searching, spreadsheets and advice from dairy consultant Steve Hossens, they decided to try sharefarming with the Atkins from July 2014. They moved out of the new house in January returning to Yelverton.

"There were lots of doubters," Mr Jenkins said. "Not many people understood our thinking. Why were we leaving our brand new house?

"The day we walked away was a hard day."

The philosophy behind the transition was to establish a simple farming system based a cost-effective feedbase on quality pastures and silage, processing their own grain, with a focus on maintaining a high production herd of registered Holsteins, building up production to three million litres or more.

"We hardly ever sold a heifer for export as it would have damaged our ability to grow," Mr Jenkins said. "But great people are the secret to good business."

And sharing with the Atkins seemed the way to go.

Mr Atkin said a strong friendship had evolved with the Jenkins, but they still had to think long and hard about entering into a sharefarming agreement.

"We already had considerable respect as well as friendship for Andrew and Claire," Mr Atkin said. "We both had good jobs but they weren't going to deliver us the financial targets we had set ourselves.

"We thought long and hard about the offer to come sharefarming. We'd completely move from the safety net of a weekly wage to something that is potentially much bigger, but a bit more risky too.

"We saw it as an opportunity to be involved in the industry on a higher level and knew it would be one heck of a challenge.

"In the end we resolved to give it our best shot. You miss 100% of the shots you don't take."

Mr Jenkins outlined the deal.

"Jeremy and Kadie manage our 290ha Denmark milking platform plus leased support land with currently 390 cows in milk. They set up their own ABN and employ and pay all staff.

"We pay all capital and running costs. Their efforts are rewarded by a percentage of milk income — that sits within what is regarded as an industry acceptable figure."

Mr Atkin said: "We were handed their farm, their cows and their pastures they'd worked so hard to improve as well as their new house for me to put my bride in, and we were given financial incentive to look after it all really well.

"We arrived at a production-based formula that delivered the right balance of reward for effort. Some people question a formula where there is no incentive to drive costs down and increase margins that way."

Mr Jenkins said people asked if that would mean the Atkins would spend money on the farm unwisely.

Mr Atkin said with 9500 litres high-performing cows and a high input farm, there was room for growth in terms of litres per ha — if they get their pastures and summer feeding right.

"Cell count, animal husbandry, our joining program and calving pattern — all could have an impact," he said.

Jeremy Atkin, Andrew Jenkins, Kadie Atkin and Claire Jenkins tell their story at the Western Dairy Dairy Innovation Day.

Mr Jenkins said the couples talk all the time and discuss and thrash out all expenditure items. "So I never feel as if we don't care about every item we spend," he said.

"The most difficult thing was handing over control and explaining to everyone that Jeremy was now the boss, not me.

"We eased Jeremy into this between September and January and then threw him in the deep end.

"During these months I tried to step back a bit. But the phone bill was big in the first few months.

"There was a lot of things for him to absorb about the farm and a lot of it had to be extracted from me.

"The 2014 season did not help. It forgot to rain in Denmark, with only 500 millimetres for the year."

Mr Atkin said the most difficult things for him was he had to learn to be a boss and Mrs Atkin had to learn to be a dairyfarmer.

"But we are better off now than when working two full-time jobs, although we are a bit busier than we used to be," he said.

"The first year was awesome. I lost my best friend, got married and started a business venture.

"Granted it was a venture deal. I did not have anything to lose but Andrew and Claire did and we respect that fact enormously."

Mr Jenkins said the farm needed to hit the three million litres to make the venture viable. "We exceeded that in the first three months," he said.

The cows look great and the cell count is down, due to Mrs Atkin's experience as a veterinary nurse. The next year or so will be time for consolidation and possibly growth in milk production.

The Jenkins aim for this year is to pay off the cows at Yelverton. For Mr Atkin it is to get better at managing people. "The acid test is longevity in the industry" Mr Atkin said.

The feedpad at the Hortin farm has reduced feed wastage. Picture by Dr Neil Moss.

Good business becomes great business

Key points

- ✔ Feedpad built to reduce feed wastage
- ✔ Concentrates predominantly fed in ration
- ✔ Pasture management aims at quality

By **Frank Smith**

THE Hortin Grazing company of Torbay on Western Australia's south coast, between Denmark and Albany, consists of Robert, Les, Leanne, Dawn and Zak Hortin. They farm 1650 hectares, of which 220ha is reserved for the dairy enterprise. The arable part of the farm runs a beef enterprise and grows fodder for the dairy side.

Pastures are rain-fed and consist mainly of kikuyu oversown with clover and annual ryegrass.

The region has cool dry summers with good pasture conditions for much of the year.

Autumn and winter can be a challenging time for the herd due to excessive rainfall, which can cause problems of trafficability.

The year can be divided into four months grazing, four months transitional and four months of zero grazing. The four months of no pasture growth coincides with peak milk prices.

The herd consists of 450-500 Holstein cows in milk, producing 3.65 million litres of milk. All the cows are mated to bulls, and calving is split with half calving between December and April and half between late July and the end of September. Bulls with high levels of genetic merit are bought from well-known WA studs.

This year the Hortins hosted Western Dairy's Dairy Innovation Day 2015 on their property.

They not only provided the venue, they allowed visitors to examine and critique their business and to discuss their options for improvement, in a question-and-answer session with Rob and Zac Hortin, moderated by their consultant Dr Neil Moss.

The Hortins explained that while the dairy business had been clearly successful, they had felt there was some room for improvement particularly in two areas: silage quality and feed waste.

This led to the family's decision to last year build a feedpad on Dr Moss's advice.

The feedpad made sense for a number of reasons.

The had not wanted to increase the number of cows, which they felt was a good fit with existing infrastructure, dairy shed and available family and hired labour, so they decided their best route to improved profit was to improve production per cow.

Their target is a bodyweight/milk solids ratio yielding two kilograms of milk solids per day from a 600kg cow. They were already in the right ball park but felt they could do a bit better.

"We were not getting the most out of cows due to feed wastage," Rob said. They needed to maximise the margin over feed cost and minimise waste.

The Hortins make silage in round bales with grass pre-chopped in the baler. Bales had been handled by a bale grab on a tractor fore loader and fed out to the herd on the ground, resulting in wastage estimated at 15-25%. In addition the farm can become boggy with a paddock drainage problem in winter.

Despite having a mixing wagon, they were reluctant to feed concentrates along with the silage.

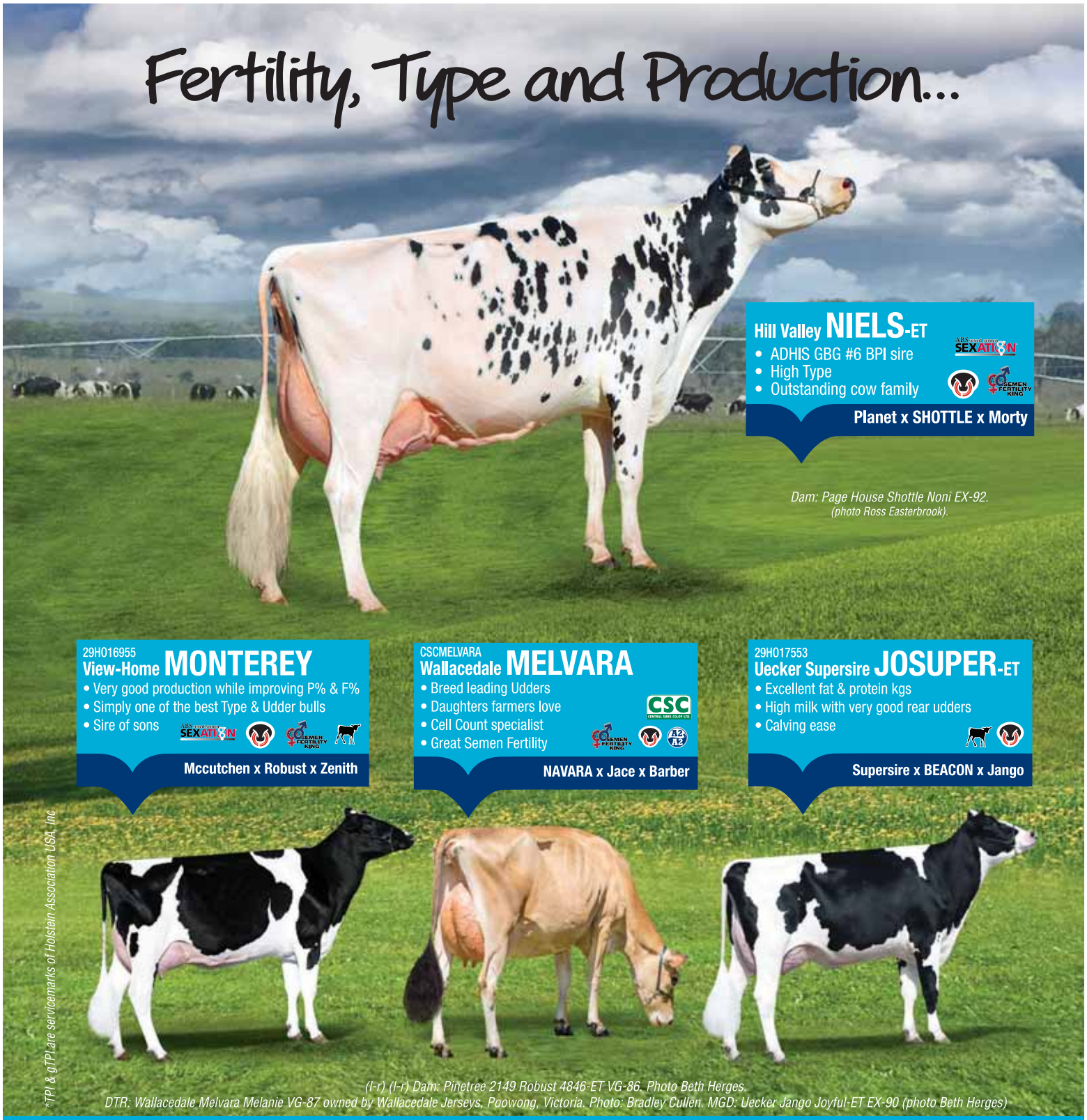
The effect of this was limiting cows' intake of concentrates to the amount they could eat in the dairy, which was limiting production. "We also had some problems with acidosis when too much grain was fed in the dairy," Rob said.

They travelled to Victoria to look at designs for a feedpad and chose a low maintenance concrete pad wide enough (five metres) for the mixer to travel along the trough and allowing 2.7m/cow of fed space. Cost came out at about $500 per cow.

"The feedpad has a dual role acting as a laneway," Zac said. "Location is important so the water drains down the slope, and it is situated so cows go along it on the way to grass."

The result was more milk in sum- ▶

Fertility, Type and Production...



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All but four kilograms of concentrates is now mixed with silage and fed on the feedpad, reducing the risk of acidosis.

Their target is a bodyweight/milk solids ratio yielding two kilograms of milk solids per day from a 600kg cow.

Zac and Rob Hortin have refined their feeding system.

◀mer from the same number of cows. The feedpad also allowed them to take advantage of times when the ratio between concentrate and milk prices were favourable by increasing concentrate intake.

The second major change was to improve the quality of silage. About 3700 round bales of silage are made in October. Quality is variable with neutral detergent fibre (NDF) of more than 50% and protein less than 12%.

Silage is the predominant source of fodder for much of the year making up 100% of the fodder for three to four months and 50% for another three to four months. Intake of 10-12kg dry matter per day is targeted but cows are picky and if the quality is too low intake falls.

The first innovation was to sort silage into lines of similar quality. Ideally this would have involved feed tests but this was impractical so they developed a subjective grading system based on the proportion of leaf to stem.

Silage bales were then stacked in lines of similar quality. Later testing confirmed that this grading was highly correlated with feed value.

Dr Moss suggested increasing nitrogen be applied to pastures to improve yield, protein and leaf:stem ratio.

He recommended 1.5kg/ha/day and an application of 30kg/ha about three weeks before cutting grass for silage. The result was silage with lower NDF and higher protein with metabolisable energy of 10-12 megajoules/kg.

There was also some room for improvement in grazing management, especially in spring to improve pasture quality.

The grazing rotation was targeted at 2-2.5 leaf ryegrass to help delay heading and retain higher quality pasture for longer. The initial rotation length of 26 days was dropped to 21 and later to 15 days.

Another change involved choosing a ryegrass cultivar with a longer growing season and pasture topping to discourage early heading. Kikuyu pastures are sprayed with RoundUp and oversown with ryegrass every four years or so. The kikuyu regenerates from rhizomes maintaining a mixed sward.

'The had not wanted to increase the number of cows, which they felt was a good fit with existing infrastructure, dairy shed and available family and hired labour, so they decided their best route to improved profit was to improve production per cow.'

Once the silage harvest was completed, the Hintons prepared a comprehensive budget to manage the feeding out of the different grades of silage.

This also allowed them to contract in advance for their grain requirements, while grain prices were reasonable and there was a buyer's market, rather than buy as needed later in the season.

Lupins are the major protein source, but canola meal is also available locally and Dr Moss suggested adding some to the ration to provide a broader range of amino acids.

About 4kg of concentrate, including all the mineral supplements, are fed in the dairy. The rest is now mixed with silage and fed on the feedpad, reducing the risk of acidosis.

An automatic feed system was installed in the dairy. This had been set to respond to milk production, reducing the feed when milk yield fell, but Dr Moss said this should be changed.

"This punishes cows rather than challenges them; they often lose tissue as milk yields decline," Dr Moss said. "That should be changed to a challenge system where cows are fed to a targeted feed intake level and held at that level for seven weeks."

At the time the Hintons were using a roller mill for grain and lupins. The result was cows failing to fully digest concentrates with grain evident in the cow pats.

Dr Moss said there was no need to over monitor performance — death by data could be a problem in modern farming. The two essentials were milk solids/cow and margin over feed costs.

Rob Hinton said the overall results of the changes included an increase in herd size of 5% and increased milk solids by 20-30% for only a 10% increase in concentrates fed.

"Running a business in the same way as you always do works, but if someone like Neil comes in he will sees things you don't see yourself," Rob said.

The result is that a well run dairy business has become a great dairy business. D

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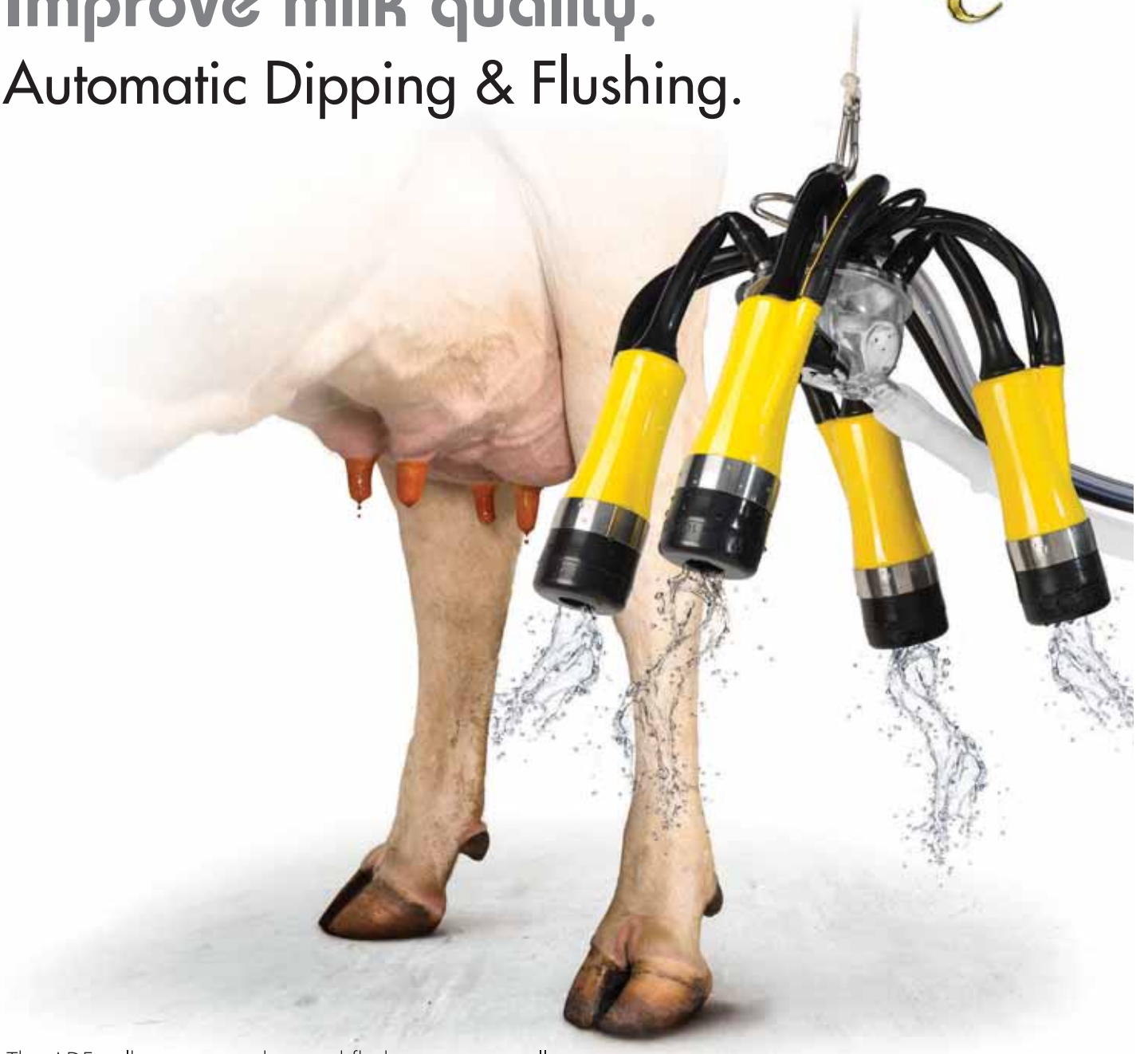

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New insights into categorising cows

Key points

- ✔ Categorise cows by pregnancy and lactation status
- ✔ Reduce percentage of dry, pregnant cows to increase production
- ✔ Feed management key factor

By **John Moran***

ADVISERS are always seeking different and simpler ways to better understand the constraints of farm performance, especially on smallholder farms in developing countries. The following describes a simple process of categorising milking cows on any dairy farm, large or small, to better understand two major influences on their performance: the duration of their lactation and the length of their calving to conception interval.

'The important numbers are the percentages of cows in the herd that are dry and pregnant because this is the period (once lactation ceases) they must go through to grow the calf in utero and when income generation falls to zero.'

There are various ways to categorise milking cows on any dairy farm. Variables such as daily milk yield (for example, less than eight, eight to 12, 12 to 16, more than 16 kilograms/cow/day) and stage of lactation (early, mid, late or non-lactating) are the most common categories used on all farms. There are other ways of categorising cows, which are just as easy and even more informative that are worthy of discussing. This article describes two production characteristics of a herd and then explains what they describe about the feeding and herd management on any farm. These are lactation length and pregnancy status.

Categorising the milking herd

Adult cows are either lactating (wet) or non-lactating (dry). In the process of their full lactation they are either non-pregnant or pregnant. Pregnancy status is best determined through pregnancy diagnosis (that is an internal examination of the uterus by an experienced technician or veterinarian) but can also be ascertained by return to service (that is whether the cow cycles in about 21 days since it was last inseminated or serviced by a bull).

Each cow can be categorised as follows:

1. Wet and non-pregnant (W/NP) — when the cow calves down and before it conceives, usually some time during early lactation.

2. Wet and pregnant (W/P) — following conception and up to when the cow is dried off (either naturally or through management).

3. Dry and pregnant (D/P) — between drying off and calving down; this determines the minimal length of the dry period.

4. Dry and non-pregnant (D/NP) — which should not occur but unfortunately often does.

Using a range of typical scenarios on any dairy farm, Table 1 and 2 provide data on the minimal length of the dry period and the proportion of cows (including first calf heifers) in each category. The D/NP category is not included in this table because on any ▶

Table 1: The influence of days from calving to conception and lactation length on the calving interval and on the length of the dry period.

Lactation length (days)	Calving to conception (days)		
	90	120	150
	Calving interval (days)		
	370	400	430
	Dry period		
330	40	70	100
300	70	100	130
270	100	130	160
240	130	160	190

Table 2: The influence of days from calving to conception and lactation length on the percentage of milking cows in the herd in one of three cow categories — wet/non-pregnant (W/NP), wet/pregnant (W/P) or dry/pregnant (D/P).

Lactation length (days)	Status (% herd)	Calving to conception (days)		
		90	120	150
330	W/NP	24	30	35
	W/P	65	52	42
	D/P	11	18	23
300	W/NP	24	30	35
	W/P	57	45	35
	DP	19	25	30
270	W/NP	24	30	35
	W/P	49	37	28
	D/P	27	33	37
240	W/NP	24	30	35
	W/P	41	30	21
	D/P	35	40	44

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well-managed farm, all cows should successfully conceive some time during their lactation.

It is assumed that the gestation period is 280 days in length. The calving interval can be as low as 360 days, but is typically more like 400 days on most well-managed farms. The tables are for year-round calving herds where the data represents the proportion of the herd in any one status on any one day during the year.

These scenarios for herd averages listed in Tables 1 and 2 are for:

- Days from calving to conception: is assumed to occur on average either at 90, 120 or 150 days into lactation.
- Lactation length: this is assumed to range from 240 days to 330 days in monthly steps (of 30 days for each month).

It is recommended that cows are dried off at least 60 days before parturition to allow the udder to fully recuperate in preparation for the next lactation.

Therefore the dry period in cows conceiving within 90 days of calving and milking for 330 days would be too short. Cows in this category should ideally be dried off after 310 days milking. From Table 1, with calving intervals ranging from 370 to 430 days (or 12.3 to 14.3 months), the associated dry periods range from 40 to 190 days.

Clearly, the earlier cows conceive after calving and the greater proportion of time that they pregnant during lactation, the greater will be their income from milk production.

There are no substantial additional feed costs of pregnancy to milking cows if they are non-pregnant or are in their first five months (150 days) of pregnancy.

So the occurrence of early pregnancy is unlikely to adversely impact on the cow's milk yields and/or feed efficiency until the last few months of pregnancy, when the foetus is actively growing. This generally occurs after the animals have been dried off in preparation for their next lactation.

The important numbers in Table 2 are then the percentages of cows in the herd that are dry and pregnant because this is the period (once lactation ceases) they must go through to grow the calf in utero, while not producing a commercial income. If cows are conceiving earlier after calving and milking for longer, dry and pregnant cows can compromise less than 20% of the herd. However if conceptions are delayed and/or the duration of lactation is truncated, the number of dry and pregnant cows can exceed 40%.

Delayed conception and early drying off

To address these problems of delayed conception and early drying off, close attention to feeding management is of the utmost importance. This is essential firstly so cows can minimise the period in which they are in negative energy balance and therefore losing liveweight. Once this phase has passed, metabolic signals direct the brain to allow the ovaries to start cycling, resulting in successful ovulations and consequently viable conceptions.

Secondly, it is also necessary to provide a consistent supply of feed nutrients to sustain milk yields to produce sufficient long-term quantities of milk at commercial levels for as long as possible. Failure to do so will result in shorter lactations and longer dry periods in the herd. This means a reduction in financial returns for the farmer.

This is particularly relevant to many tropical smallholder dairy systems as the genetic merit of their cows is rapidly improving as a result of improved dairy genes either through the use of imported semen and/or live animals. Unfortunately, associated with this is an increasing occurrence of repeat breeding as well as short lactations arising from inadequate knowledge of dietary energy and protein requirements for these potentially highly productive animals.

Dealing with dry/non-pregnant cows

Table 2 does not deal with the fourth category in milking herds, namely the D/NP cows. These cows will be non-productive for many months and will cost money every day for at least the next 280 days.

If their poor condition is nutritionally induced, without any change in feeding management, it is likely they will not generate any milk income until well beyond 280 days.

A decision will also have to be made as to whether such animals should remain in the herd or be sold as non-productive cull cows. D

**John Moran is principal of Profitable Dairy Systems, Kyabram, Victoria. This article was written for subtropical dairy farms, particularly in developing countries, but applies equally to all farms as a different approach to looking at the herd.*

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BETTER COWS | BETTER LIFE

Improving the business value

Key points

- ✔ Different valuation methods can be used
- ✔ Might be useful to attract equity partner
- ✔ Good business practices increases value

By **Carlene Dowie**

DAIRYFARMERS can improve the value of their businesses by improving people management, ensuring they have a strong succession plan in place and improving business practices, appraiser Liesl Malcolm told this year's Australian Dairy Conference.

Ms Malcolm, a senior manager in the corporate finance division of Pitcher Partners, told the business-themed conference there could be more to a valuation than simply valuing the assets and liabilities in the business.

She outlined the four main types of valuations: capitalisation of future maintainable earnings; asset based; industry specific (rule of thumb); and discounted cash flow.

Banks often used the simple assets-based approach, which looked at a company's balance sheet and put a market value on each of the assets and liabilities. "It is an approach commonly requested by banks because what they will see is almost their worst-case scenario," Ms Malcolm said.

"It is also generally used for a business that is asset rich or is not generating a sufficient level of earnings/returns from its assets."

Under an asset-based approach, the appraiser worked through the assets on the balance sheet and made adjustments. For example, land and buildings might be worth a little less than on the balance sheet because they might have to be sold at a slight discount and the debtors might be slightly lower to account for bad debts. Intangibles were also not included because the valuation only looked at those things that could be sold.

The liabilities side would include an allowance for employee provisions if the business was no longer continuing and costs that might be incurred in selling assets.

But other types of valuations could give a different picture to the asset-based valuation. The discounted cash-flow method was most appropriate for business with volatile earnings, a growing or new business or a business that was changing.

Banks might request this discounted cash-flow valuation, in addition to the assets-based approach, to get a better idea of how the business was operating.

This valuation could also be used by a farm business looking to offer someone equity in that business — because it would give a better idea of the true value of the business as an ongoing concern and the future returns to the investor.

A discounted cash-flow valuation looked at the expected future economic benefits of the business discounted to the present value. It looked at forecast cash flows as well as the likely value of the investment at the end of the investment and applied a discount rate to that.

'It is much easier to value a business that has all the information at hand — not one where the financial statements are difficult to find and not reliable.'

Businesses that provided long-term forecasts would generally have a higher value under this system — providing the business was growing and the forecasts were right, Ms Malcolm said.

The discounted cash-flow valuation started with ungeared post-tax cash flows. The cash flows were adjusted for a number of things, including:

- capital expenditure requirements in the business;
- an allowance for market rent; for example where a farm operator owned the land;
- an allowance for market salaries for all employees including management and owners; and
- adding back in any non-business expenditure — so things that are put through the business that were not really a business expense

Once the ungeared cash flows were calculated, the discount rate was then applied. The discount rate reflected the relative risk of the investment as well as the time value of the money.

The discount rate took into account the cost of equity and cost of debt in the business. It also looked at the risk to the business.

"The discount rate will differ depending on the farm being valued and the risk to that business," she said.

The keys to increasing the value of the business under this method were increasing its earnings and profitability and/or reducing the risk.

Increased earning and profitability meant greater cash flows, and providing they were realistic and supportable, the greater the value of the farm.

The risk of the business (and therefore the lower the discount rate applied) could be improved by:

- having a stable workforce with long-term employees;
- having succession plans for key staff to reduce reliance on these people;
- having a strong management team;
- having strong relationships with customers and suppliers;
- building new relationships with new customers;
- developing a business plan setting the short-and-long-term strategy for the business;
- negotiating favourable agreements with key stakeholders; for example a long-term lease with the owner of the farm/property;
- monitoring the performance of competitors and identifying ways the farm could improve; and
- corporatising as much as possible, documenting all policies and procedures, having occupational health and safety plans, preparing detailed financial statements, preparing forecasts/budgets, undertaking industry research and conducting training.

"It is much easier to value a business that has all the information at hand — not one where the financial statements are difficult to find and not reliable," Ms Malcolm said.

It was also important to have a good relationship with bankers.

"Succession planning is worth a lot," Ms Malcolm said. "If you have a business and the owner got hit by a bus tomorrow and the business could not operate, it is very difficult to put substantial value on that business because it is so reliant on that key person being there."

Getting investment ready

Key points

- ✔ Improve record keeping, business planning
- ✔ Look to exit strategy if business getting large
- ✔ Be able to explain investment strategy

By **Laura Griffin**

Australia China Business Council's Jeremy Loeliger (left) listens to Dairy Australia's Neil Lane. They are pictured with Dig & Fish consultancy's director Angie Bradbury.

AUSTRALIAN farms need to be "investment ready" to attract the necessary capital to take advantage of the growing global food demand.

Dairy Australia farm business management program manager Neil Lane told the inaugural AgriVictoria forum in Melbourne that to attract foreign or domestic investment, farmers needed to improve record keeping, business planning and growth — and such discipline was necessary and beneficial regardless of plans to raise capital.

Mr Lane said investment could help operation's boost productivity, gain a competitive edge and grow.

"From a farmer's perspective the investor requirements in terms of reporting and articulating what's going on is probably the biggest change and challenge, such as an operational budget and cash flow," Mr Lane said.

"It is not the time to seek outside investment when your costs are eating up profits and you are having troubles with the bank."

He said the investment process didn't happen overnight, it was a six to 18 month process "at least".

As such, farmers who wanted to sell their business or part of it in the next 5-10 years should start keeping better records, reporting and planning now.

He said farms were growing in size and that had implications for people's exit strategy because funds and corporations would likely to be able to afford to buy a farm that was worth $5 million, $10 million or $15 million.

His three steps to get investment ready were:

Step 1: Pitch your investment opportunity with an "Information Memorandum".

Step 2: Agree on the rules of engagement.

Step 3: Negotiate an agreement.

Essentially, the first step was to outline the case for investment, including an overview of industry and a business case.

"You as the operator have to prove you know the business inside out, and many of these are intuitive, but you need to document them," he said.

This could involve skills beyond the traditional farmer's role, so Mr Lane suggested getting an easy-to-use accounting package or seeking training.

"You have to understand and be able to explain how investment fits into your business strategy for growth and profitability," he said.

> ***'From a farmer's perspective the investor requirements in terms of reporting and articulating what's going on is probably the biggest change and challenge.'***

Then both parties needed to work through due diligence.

"This is where you get to ask the difficult questions of each other," he said. "If you can't get through this process then you probably should step away.

"It comes down to are the people right? And is the proposition right?"

Farmers had to be willing to disclose past performance, current position (balance sheet), performance forecast and sensitivities to market, climate and other factors.

He suggested considering investment partnerships "as a marriage of capital and expertise".

He said farmers needed to agree on the rules of engagement, including who would do repairs and maintenance, detail of expectations (including on reporting) and how involved the investor would be in running the farm.

"In the dairy industry, we think only about 15% of farmers do monthly cash-flow budget, and of those most do them on the request of their bank," he said.

"But an investor will want to know are they on track, if not operator needs to be able to explain those variations and for some people that can be quite onerous."

The negotiations should also cover expectations of working culture, including the treatment of workers, suppliers, clients and service providers.

Dairy Australia director John McKillop said the Federal Government's tightening of foreign investment rules was at odds with its calls for more investment from outside of the agricultural industry.

"While we have a government that is crying out for further investment in agriculture to fulfil this vision, we have one that is about to introduce legislation that will effectively impose a zero threshold for foreign investment," Mr McKillop said.

"Reducing the threshold from $253 million to $15 million is not in itself the only issue, but that it's now cumulative so effectively any foreign investor once they reach $15 million will now need to go to the Foreign Investment Review Board (FIRB) and pay a fee up to $100,000."

He said an extension to the approval process would further deter the foreign investment needed for Australian agriculture to grow. "There's been a double standard between farming and processing and other industries such as mining," he said.

Let's talk about debt

Key points

- ✔ Debt has many demands
- ✔ Ensure return on asset higher than debt cost
- ✔ Too much debt can hurt cash flow

By **Carlene Dowie**

DEBT can help a business grow and lift its return on assets but too much debt can hamper a business and put it into a downward spiral, the Australian Dairy Conference earlier this year was told.

Deputy principal of Marcus Oldham, an independent agricultural college, Tony McMeel, who helped facilitate the business-themed conference, warned farm business owners to understand the obligations attached to debt, particularly bank debt, when looking at their business structure in the medium to long-term.

He outlined a real life case study where too much debt too soon turned a highly successful business into a struggling business (see box story next page).

There were key differences between debt (where business owners have borrowed funds in some way) and equity (where someone has invested funds in a business).

Mr McMeel said debt had a heap of demands with it, including:

- a requirement for repayment, usually to some schedule;
- an interest expense or equivalent;
- in some cases, such as a mortgage, a priority to make payments before other payments from the business;
- key assets being held as security, for example, for a mortgage; and
- in some cases, a covenant or legal restriction on the business.

Mr McMeel said owner's equity (whether that was as an owner operator or someone who had invested in the business was more fluid because:

- it did not always require the same level of commitment to pay;
- there was discretion about how the dividend (return) was paid, for example, it could be reinvested in the business; and
- there was flexibility about how the return was constructed, for example, when companies issues bonus shares.

There was also a clear hierarchy about who had rights to the assets of a business in the event of liquidation or bankruptcy. Mortgage holders, or others who had covenants across the assets such as councils for unpaid rates, had first bite at the assets up to the value of the mortgage or debt.

> ***'If you have the reverse, you are in trouble. In this case you have to pay the bank from your earnings.'***
> ***—Tony McMeel***

Taxation obligations followed those (public good exceeds individual good), then employee entitlements, secured creditors and unsecured creditors.

"Last on the list is the owners, who get anything that's leftover and quite often there is not a lot," Mr McMeel said.

"This highlights that the owners take the ultimate risk in the business; they are the ones that get paid last. Debt takes a lower risk than the owners do."

Share in income in business

Mr McMeel said it was essential for business owners to understand that when debt was used to fund assets in the business, the income generated by those assets was shared between debt holders and equity holders (the owners). If the return on assets (ROA) was greater than the cost of the debt, then the business owner shared in the surplus.

"The use of somebody else's money is making you money," Mr McMeel said. "In the ideal world that should always be the case — we want a situation where ROA is always greater than the debt.

"If you have the reverse, you are in trouble. In this case you have to pay the bank from your earnings."

Mr McMeel said it was a good thing to have debt if it was helping lift the ROA better than the cost of debt. "But if all it is doing is exacerbating the problem, if it is actually lowering your returns because you really can't afford to run the business because of your commitments to pay interest, then it was not good," he said.

It also could lead to an increase in the cost of debt. Banks liked the surety of cash flow from the business as it meant the debt could be serviced but if something looked risky they increased the cost of debt (the interest rate charged).

The problem for any business was that although there were elements of risk over which they had control, there were some over which they had no control, Mr McMeel said.

Business operators needed to run their operations to account for these risks. "At what level of debt are you getting that balance right between making money and losing money," he said.

The problem for farming was that cash flow could vary substantially. Data extracted from Dairy Australia's new business analysis program, DairyBase, showed for four farms across three years the amount of cash available to the business as a percentage of milk sales varied by as much as 40%.

All farms behaved differently, with different systems and management, so cash flows could also vary substantially.

This highlighted that the cash available to service debt might not necessarily be there. "If you do cash-flow (budgets) on what your best cash income is likely to be or even what you think the average is likely to be, it might not turn up when you need it and that's a significant element to consider," Mr McMeel said.

When a business was growing, cash flow always initially lagged behind investment, potentially putting even more of a squeeze on cash.

Mr McMeel said business owners needed to take a bigger return from any investment than the cost of the debt, because they took the biggest risk.

One of the complications in making an assessment on the returns from debt in farm businesses was where the land was owned by the by farm business owners.

In this case, there were effectively two businesses: one that invested in the land and one that operated the farm business. In assessing the returns from the land, owners would have to assume some growth in the value of that asset.

Too much debt too soon

MARCUS Oldham college deputy principal Tony McMeel outlined a case study of a farmer where too much debt too soon created problems that eventually made the business less successful.

The case study involved a farming couple who had been sharefarming successfully on a farm for a relatively short amount of time. They were on a one-third share but did not own any assets, other than a few calves that they were raising on a leased block using milk bought from the farm and which they planned to use eventually as the basis of their own herd.

They were good operators and were putting away more than $100,000 a year after deducting their living expenses.

Although challenged by their adviser as to why they would want to change what was clearly working well for them, they saw the position as a stepping stone and wanted something more.

The farm owner offered them the opportunity to buy the 250-cow herd, helping them by advancing them funds for half the purchase for two years, and offering them a 50% share.

Their adviser suggested they wait another year, concerned the high level of debt could jeopardise their ability to run the business as effectively to make the same return on assets.

Tables 1 and 2 show the initial budgets that were run using figures from the previous two years as a base and looking at the difference between buying the cows now (year 3) and delaying a year (year 4).

Mr McMeel said on paper there was little difference between the return on assets achieved between the two strategies. "If they had delayed for a year, it was not significantly different, with the net equity position slightly better (for the delay)," he said.

'They had to scrimp on costs where they should have been spending.'

"So what's wrong with actually doing it now or waiting a year — there's very little difference. The reason why is because assumptions that underpin this aren't very reliable. The likelihood of you being able to achieve that same cash flow for five years is less than zero — absolutely no hope at all."

Mr McMeel said the volatility in farm businesses meant the same level of cash flow could not be assumed. Cash flow could vary by more than 40% — there could be increases in feed or fertiliser prices or a decrease in milk prices.

Tables 3 and 4 show the result on the budgets with a 20% reduction in cash flow.

Under this scenario, the delayed strategy resulted in more equity for the sharefarmers but the return on assets and return on equity were not substantially different. This was on the assumption that the business productivity and performance continued at the same level, just that the price or costs changed.

But the major problem was that the cash available to the business went into the negative (see figures highlighted in red boxes in Table 3). "So these young people had their capital in cows, they had had cash in the bank, they were fit and agile and they could work hard," he said.

"But they had nothing to support the negative $60,000 — they'd run out of cash, that's curtains for them.

"They can't run the business at -$60,000 unless someone is going to come in and help them."

The impact of running out of cash was that their productivity fell.

"They had to make choices, they had to ▶

Table 1: Sharefarmer case study decision to move from 1/3 share of milk to 50% share: numbers on different scenarios.

Year	Share of net milk income	Other income	Debt level	Other overhead expenses	Finance expenses	Vendo finance	Livestock assets	Cash at bank	Debt	Equity	Return on asset	Return on equity
Table 1: Borrow for cow purchase this year (year 3) — assume no change in cash flow.												
Year 1	150,000						17,500	60,000	0	77,500	77.4%	77.4%
Year 2	150,000	9,000					50,000	120,000	0	170,000	40.6%	40.6%
Year 3	250,000		310,000	40,000	27,150	155,000	603,500	15,850	233,000	386,350	19.4%	24.0%
Year 4	250,000		233,000	40,000	19,400	78,000	608,500	39,450	155,000	492,950	18.5%	20.4%
Year 5	250,000		155,000	40,000	15,500		608,500	143,950	155,000	597,450	15.9%	17.5%
Table 2: Delay strategy for one year (year 4) and borrow less — assume no change in cash flow.												
Year 1	150,000						17,500	60,000	0	77,500	77.4%	77.4%
Year 2	150,000	9,000					50,000	120,000	0	170,000	40.6%	40.6%
Year 3	150,000	21,000					98,500	200,000	0	298,500	27.1%	27.1%
Year 4	250,000		190,000	40,000	16,625	95,000	608,500	55,875	142,500	521,875	18.1%	19.8%
Year 5	250,000		142,500	40,000	11,875	47,500	608,500	116,500	95,000	630,000	16.6%	17.2%
Table 3: Borrow for cow purchase this year (year 3) — assume 20% decline in cash flow (terms of trade) after year 2.												
Year 1	150,000						17,500	60,000	0	77,500	77.4%	77.4%
Year 2	150,000	9,000					50,000	120,000	0	170,000	40.6%	40.6%
Year 3	200,000		310,000	40,000	27,150	155,000	603,500	-34,150	233,000	336,350	11.6%	12.7%
Year 4	200,000		233,000	40,000	19,400	78,000	608,500	-60,550	155,000	392,950	12.8%	12.9%
Year 5	200,000		155,000	40,000	15,500		608,500	-6,050	155,000	447,450	11.6%	12.2%
Table 4: Delay strategy for one year (year 4) and borrow less — assume 20% decline in cash flow (terms of trade) after year 2.												
Year 1	150,000						17,500	60,000	0	77,500	77.4%	77.4%
Year 2	150,000	9,000					50,000	120,000	0	170,000	40.6%	40.6%
Year 3	120,000	21,000					98,500	200,000	0	298,500	17.1%	17.1%
Year 4	200,000		190,000	40,000	16,625	95,000	608,500	5,875	142,500	471,875	11.4%	11.3%
Year 5	200,000		142,500	40,000	11,875	47,500	608,500	16,500	95,000	530,000	11.2%	11.0%

◀ scrimp on costs where they should have been spending because they did not have $60,000 to support their cash flow and they still had to pay debt," he said.

"So something had to give, and the things that gave were the things they should have been spending money on to support the business.

"In reality what happened was that their return on assets fell to 3%, so cash deficit ended up a lot worse than that and they ended up borrowing from the farmer to extend what they could do and took a lot longer to pay off that herd just to get out of that trouble."

Dairy industry's unsung silage guru

Key points

- Frank Mickan involved in dairy for 44 years
- Led cutting-edge forage research
- Provides vital extension service

By **Jeanette Severs**

FRANK Mickan is the farmers' quiet guru of fodder and silage with a 44-year history spanning change and innovation, particularly in the dairy industry. That history was recognised with a Public Service Medal in this year's Australia Day honours "for outstanding public service to the primary industry sector in Victoria through the introduction of strategies to improve farming practices".

Mr Mickan has always been around dairy cows. His father farmed dairy cows, pigs and potatoes in the Otways, in southern Victoria, before moving the family to a dairy farm in Wangaratta, Victoria, in Mr Mickan's late secondary years.

This also enabled Mr Mickan to attend Dookie College to complete the Diploma of Agricultural Science.

He was always more interested in the practical side of farming and, after graduation, was employed at the Ellinbank Dairy Research Institute in Gippsland, Victoria.

Some 10 years later, as farm manager, he was already at the cutting edge of fodder-conservation research.

Ellinbank is one of three publicly funded research stations that still exist in Victoria, servicing farmers and running experimental trials. Those trials included experimental pastures species and making and wrapping silage.

Barb and Frank Mickan: Barb Mickan has travelled alongside Frank through his career as fodder and silage specialist at Ellinbank, moving onto the farm as a young wife and working alongside him when he was farm manager; and is proud of what he has achieved for dairyfarmers in the past 44 years.

Frank Mickan advocates strongly for excluding oxygen from silage pits and bales. The silage pits at Ellinbank use gravel sausage socks to exclude air and water and reduce wastage.

"Ellinbank was the first place in Australia to do wilted silage research, stacked silage research and bunker silage research," Mr Mickan said. "I was able to get a lot of practical experience using the tractor."

It was experience that led him to using some of the latest, innovative machinery and to understand harvesting techniques that he still advocates.

"Pasture should be cut when it is grazing height," Mr Mickan said. "That's when it's at its best for the cow and as dry matter there is minimal decrease in pasture quality and therefore minimal decrease in animal and milk production.

"Then the paddock can go straight back in to the rotation. It also helps with maintaining density and quality in that paddock.

"Unfortunately many farmers still cut their hay and silage before it is at grazing height."

After 20 years at Ellinbank, Mr Mickan was appointed Statewide Fodder Conservation Specialist.

It was the beginning of his involvement with providing extension advice to dairyfarmers about pasture and fodder crop agronomy. He is ideally located in West Gippsland, where the dairy industry has grown significantly.

It has enabled him to be at the forefront of silage and fodder research and advancement.

"Silage has always been important in southern Victoria and anywhere in Australia where it's too wet to make hay," Mr Mickan said.

"Making silage and fodder allows farmers to capture spring growth and, to make the most of that, it should be cut at grazing height.

"This results in a feed source that produces just a little bit less of milk production than if it was grazed as fresh pasture.

"There is only a miniscule deterioration — less than 5% — in sugars. That's if it's stored correctly.

"Silage is coming into its own. It's about more than 'ego rolls'."

Mr Mickan is referring to the rolled wrapped silage and pasture hay bales lined along a fenceline, beside a road.

"In the early days, rolled bales were seen to be relatively expensive," he said. "But across time, there is not a lot of difference between cost/tonne now."

One of the major progressions Mr

Frank Mickan checks the quality of stacked lucerne fodder.

Cutting hay and silage at optimum time produces a high quality feed for stock such as these heifers.

Mickan has noticed is the growth in heaviness of bales.

He attributes this in part to improved machinery and expertise to make bales and also to the advances in wrapping techniques and plastic.

"There's been a swing for farmers to use contractors and to bigger machinery," he said.

"As knowledge has improved, they understand now that bigger, heavier bales mean less waste in a bale.

"It's about having the machinery and expertise to build a tighter bale. And the tighter the bale, the less oxygen stored in it — and less wastage from spoilage.

"So, it's a win-win for farmers."

Mr Mickan said a properly made and wrapped bale excluding oxygen should only see 3-5% fermentation across time, therefore less waste.

These losses are compared to 10-15% in a precision chop and 15-20% loss of hay in a loader wagon.

"As long as the bales aren't punctured and are wrapped well," Mr Mickan said.

"Not looking after the bales and not repairing holes can result in 40% loss of silage in moulds, spoilage and composting occurring within the bale.

"So you lose dry matter and quality. Consequently, you lose production and money."

Mr Mickan advocates the same stringency be applied to silage pits and points to the need to exclude air and water.

He is critical of using tyres to hold down covers, as they do not exclude air and water; and recommends gravel socks.

"Gravel sausage socks on silage pits fit spaces tight and are a better seal to eliminate air egress," he said. "And they should overlap so air cannot get between the sausages."

Another hazard of fodder storage is rodents. Mr Mickan recommends using a clear area where baits are laid out and being intelligent when harvesting cereals.

'Making silage and fodder allows farmers to capture spring growth and, to make the most of that, it should be cut at grazing height.'

"Cereal crops are often harvested with the long seed head intact — as whole crop silage," he said. "It attracts rodents. The mongrels can sniff out the grain heads through the plastic and they burrow in to get it — it's a delicacy for them.

"So you have to have baits on the bare ground to kill them.

"Otherwise, when you feed out the silage with dead animals in it, you get botulism in your cows and consequently milk is affected.

"It's one of the worst health hazards."

And what is the best pasture for dairy cattle? "The best pasture for dairy cows is still a perennial ryegrass, for its adaptability and high quality," Mr Mickan said.

Hay: the good, the bad and the mouldy

Key points

- Feeds high in ME and CP vital for production
- Poor quality feeds lead to range of problems
- Mould reduces quality, makes hay less palatable

By **Frank Mickan**
Department of Economic Development, Jobs, Transport and Resources
Ellinbank Centre, Victoria

MANY farmers feed hay to milking cows and wonder why they do not produce as much milk as they think they should. The good, the bad and the mouldy hold the keys to the answer to this problem.

The good: Hay for milking cows must be high in metabolisable energy (ME) and crude protein (CP) and low in neutral detergent fibre (NDF).

The bad: Hay low in nutritive value may maintain cattle but so often needs a higher quality feed to supplement it for a modicum of production.

'Even if fed ad lib with this, the cattle could never eat enough to get the amount of ME and CP they need.'

The mouldy: Hay often contains mould, sometimes not easily seen, resulting in lost material, reduced quality and potentially health problems.

Table 1 shows the suggested nutritive values for hays required to enable cows to produce high milk yields and put on condition (A) and the minimal values to just maintain a dry cow (B).

Hays of high nutritive values would most likely be legumes such as clovers, vetches and vegetative-to-early flowering lucerne. For pasture hay to be this high in quality, the plants at mowing must have been leafy, with lush stalks and minimal seed head, which is a rare sight unfortunately.

However, this is where silage fits in to the feed equation.

The minimal quality values (Table 1, B) are those necessary to allow the cow to eat enough to meet its energy needs. Low quality feeds are slow to digest and a poor source of nutrients for rumen bugs. This can result in cows not being able to digest enough feed in a day to keep up with energy demands. In these circumstances, body tissue breakdown (weight loss) will occur.

Some hays could be so low in quality that cows could not survive on them if they were the only source of feed for a long enough period of time.

However, many hays of about eight megajoules of metabolisable energy per kilogram dry matter (MJ ME/kg DM) will have crude protein values well below the critical level of about 9% crude protein (% CP).

Exceptions to this may be severely rain-damaged legumes, which may have crude proteins of 10-14% CP.

Obviously if the animals are receiving other feeds in the diet such as grain, dry pasture or silage, this will impact on animal production.

Table 2 shows the mean and range of nutritive values of hay samples sent for feed analysis to a Victorian laboratory between July 2013 and June 2014. Note these were not representative of all hays made and it is highly probable that many samples of poor hay were never submitted for obvious reasons, but, if analysed, would drag the mean figure down.

Look carefully at the mean of each analysis and for the various species of hay. The ME means do not vary

Table 1: Nutritive values of various hay species needed for high milk production or for dry cow maintenance.

Hay descriptions	Metabolisable Energy ME (megajoules of ME/kilogram dry matter)	Crude Protein CP (%)	Neutral Detergent Fibre NDF (%)
Quality required for high milk production (A)	Over 10.5	Over 16	Less than 50
As quality gets worse from levels at A, animal production decreases to levels at B			
Minimal quality for dry cow maintenance (B)	~8	~9	~65
As quality gets worse from levels at B, animals will lose weight more rapidly, eventually dying			

Table 2: Mean and range (in brackets) of nutritive values of hay samples: 2013/2014 season

Hay descriptions	No. of Samples	Metabolisable Energy ME (MJ/kg DM)	Crude Protein CP (%)	Neutral Detergent Fibre NDF (%)
Legume	91	9.4 (7.2-11.8)	17.2 (4.9-25.8)	46.6 (31.6-67.5)
Legume/grass (legume dominant)	116	9.4 (6.5-11.7)	14.3 (5.6-24.9)	50.5 (37.1-72.4)
Grass/legume (grass dominant)	115	8.8 (5.1-11.3)	10.2 (1.8-21.0)	57.7 (39.9-89.1)
Grass	515	9.1 (5.1-14.0)	11.1 (1.8-23.4)	56.8 (24.6-83.8)
Cereal	1812	8.9 (4.0-12.4)	7.2 (1.2-18.7)	56.3 (27.5-81.4)
Cereal/legume	135	9.2 (6.6-11.8)	11.0 (3.8-22.5)	54.2 (37.9-69.2)

Source: Feedtest July 1, 2013-June 30, 2014
Please note: This information is produced using data from Feedtest records, derived from samples as submitted by clients. Feedtest produces these tables for the information of clients merely to demonstrate the range in quality that can occur for a given type of feed.

much between species although the legumes MEs are higher, as expected.

However, there is a widespread between the means of species in proteins contents, so go for these if needing extra protein in the diet, unless other sources of protein are cheaper per delivered and fed tonne DM. The neutral detergent fibre (NDF) mean is reasonable for the legume hays and a smudge higher for the legume-dominant mixed hay but much higher for the other species and mixes.

Now that you have digested all that, forget it! The means mean nothing. What is crucial is the quality of the hay.

Look at Table 2 again. Now, look carefully at the ranges within all the species and ME, CP and NDF columns. Look back at Table 1 and at what is needed for high animal production (Table 1, A) and the bottom line (Table 1, B) to maintain a dry cow.

There are hays in all species with nutritive values that can sustain high animal production but also in each are hays that contain ME, CP and NDF well below animal survival levels. The worst figures almost equate to cardboard.

Even if fed ad lib with this, the cattle could never eat enough to get the amount of ME and CP they need. In these circumstances, animals take energy from their own bodies, resulting in skinny cows, weak or dead calves and poor in-calf rates and/or late in calf rates.

Figure 1: Mouldy hay results in reduced animal production.

I hear so often that "I've got to feed it anyway" and/or "I am only going to feed it to my dry stock, which don't need high quality hay".

A few things spring to mind here. The hay may be so poor as not to even support maintenance or only poor production levels. It is too late to do anything if fed for too long before it becomes obvious there is a problem. The average dry cow should be receiving about 90 MJ ME/day in the early dry period, and this rapidly increases to 120 ME in the ninth month of pregnancy.

Mouldy hay

Mouldy hay (see Figure 1) is generally less palatable to cattle, usually less nutritious and can cause animal and occasionally human health problems. Unfortunately standard chemical and near-infrared spectroscopy (NIR) measurements of forage quality provide little indication of mouldiness of hay.

Two lots of hay can have almost the same Feedtest analysis but one lot may be mouldy and the other not. Until better measuring techniques are developed for identifying and quantifying mould levels, visual descriptions of mouldiness of hay is the best available means of assessment.

Research in the US has shown that even hay baled under the best of conditions may contain 1-2% of total fungal biomass; in poor hay-making weather, total fungal biomass in severely moulded hay may reach 10-12%.

Moulds live on the energy component (reported as ME) and protein in feeds, so the greater the level of mould, the greater the reduction of nutrients and DM, not to mention animals don't like to eat mouldy hay. All these result in reduced animal production.

The full story about mouldy hay

Key points

- Mouldy hay mostly due to baling too wet
- Can cause reduced intake by animals
- Hay preservatives can help prevent mould

By **Frank Mickan**
Department of Economic Development, Jobs, Transport and Resources
Ellinbank Centre, Victoria

MOULDY hay is usually a result of baling forage too wet. Moulds live and multiply by consuming the energy and protein in the hay so the more mould, the greater the loss of hay dry matter and nutritive value. If hay is too wet, heat and moisture (plus carbon dioxide) is produced, compounding the problem that can lead to spontaneous combustion (a self-ignited haystack fire).

If heat exceeds about 380 degrees Celsius in the hay, there is reaction between the amino acids in the protein and the plant sugars (Maillard Reaction) that causes darkening and it becomes less degradable and/or less digestible. This is referred to as caramelised hay and recognised by brown to dark brown material in the centre of bales or stacks of bales.

This hay is palatable to stock but it has lost much of its energy and digestible protein. If heating caused by various mechanisms (heat-resistant bacteria and fungi, heat-producing chemical reactions) continues and it cannot escape from the bale or stack, the next step is spontaneous combustion.

Mouldy hay starts in the standing crop. Plant leaves and stem surfaces are mainly covered with bacteria, which helps protect the living plant from fungal infection and yeasts. Once mown the moisture content of the plants rapidly decreases.

Table 1: Recommended moisture contents (%) for safe storage of hay in various bale types.

Bale type	Moisture content range (%)
Small rectangular bales	16-18
Round bales (soft centre)	14-16
Round bales (hard centre)	13-15
Large rectangular bales	12-14
Export bales	Under 12

If heat exceeds about 380 degrees Celsius in the hay, there is reaction a between the amino acids in the protein and the plant sugars (Maillard Reaction) that causes darkening and it becomes less degradable and/or less digestible.

The result is that the predominant bacteria and yeast on the standing crop are no longer competitive and becoming less so as the crop continues to cure.

Conditions in the mown forage allow a new group of microbes (bacteria, some yeasts and a greater presence of fungi) to start multiplying. These feed off sugars and organic acids emitted from the plant during the curing process.

The more rapidly forage dries down in the windrow, the lower the dry matter losses occurring from the growth of fungi. Dustiness in hay without visible mould is usually a result of fungi growing in the windrow.

Once the forage is baled another new group of mainly fungi and yeasts start to multiply, especially when the moisture content is between 20% and 30%. These new fungi out-compete the windrow fungi because they grow at the lower moisture levels and higher temperatures that occur in baled hay.

In storage the main groups of fungi that start to grow are *Alternaria*, *Aspergillus*, *Cladosporum, Fusarium*, *Mucor*, *Penicillium* and *Rhizopus*. Some of the specific fungi that grow during bale storage, such as *Aspergillis flavus*, are known to produce mycotoxins and may cause animal health problems.

However, the production of mycotoxins is minimal or non-existent in hay that has been cured to recommended levels (see Table 1).

Temperatures within a bale almost always increase after baling due to natural plant reactions and increase in bacteria populations. This is why moisture meter readings several days post-baling are higher than at baling.

However, the temperature never gets high enough to cause heat damage in well-cured hay. Normally bale temperatures decline after about two weeks but in moist hay they can exceed 150°C in the following weeks, causing excessive heat damage, browning or even charring of hay, and at this stage potentially a high risk of fire.

The various types of fungi grow best in their own ideal temperature and moisture level, but interestingly, while mouldy hay and heat-damaged hay go hand-in-hand, the fungi alone cause little heat damage.

Management-wise fungi do not grow well in hay at the recommended moisture levels for each bale form (see Table 1).

Most hay made will have at least ▶

QUALITY FORAGE LEADS TO GOOD PRODUCTION

Poor forage quality can negatively affect rumen function, performance and even lead to Sub Acute Ruminal Acidosis (SARA)

When unstable or moldy feeds are ingested by cattle, the consequences on rumen function and resulting performance can be difficult to manage and expensive to remedy.

Fed unstable forages, a cow with borderline rumen function can easily develop Sub Acute Ruminal Acidosis (SARA). When SARA occurs, rumen function isn't optimized to make the best use of any ration. SARA is simply an occupational hazard for the modern dairy cow, and costs are estimated at more than **$1.00** per cow daily.[1,2]

Keep forages stable during feedout and help maintain rumen function — and performance.

Keep Silage Stable During Feedout

Aerobic instability during feedout can often cause spoilage yeasts, bacteria and mold to grow. Spoilage yeasts are found naturally on all growing crops. Once feedout surfaces are exposed to oxygen, the yeasts will start to multiply. Research-proven forage inoculants, such as ***Lalsil HC*** can help combat aerobic instability.

Unstable forages pose a real threat to rumen function and performance — especially during summer months when the risk of SARA can be greater.

In fact, a study showed that the presence of spoilage yeast from 10^5 to 10^9 colony-forming units (CFU) per gram equivalents in corn silage routinely and significantly reduced rumen pH by 0.4 units.[3]

Comparison of Studies Feeding Aerobically Unstable Forages

Forage	Inclusion Rate in the Ration Dry Matter	Milk Yield Reduction	Dry Matter Intake Reduction
Aerobically unstable high-moisture shell corn (HMSC) [4]	33%[4]	3.2 kgs. per cow daily[4]	No Change[4]
Aerobically unstable HMSC[5]	29%[5]	1kg per cow daily[5]	No Change[5]
Aerobically spoiled corn silage[6]	5.4%[6]	—	-7.4% reduction[6]

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◀some mould growth. In hay, mould growth comprises mycelium and spores. Mycelium are the stringy growth structure of fungi, and spores are the reproductive or seed like structures.

The main concern of mouldy hay fed to cattle is the total amount of mycelium and spores combined or the total fungal biomass but spores can cause respiratory problems in humans and horses. In hay, the white mould is mycelium and the dustiness is from the tiny spores.

Mould and hay quality

Results from specific tests have shown even hay harvested under the best of conditions often contains 1-2% total fungal biomass, but severely moulded hay may contain up to 10-12% total fungal biomass. Cattle do not like eating mould, and in the moulding process, there is a substantial loss of other nutrients.

Standard chemical and near infrared reflectance (NIR) measurements of forage quality provide little indication of mouldiness such that two lots of hay can have almost the same nutritive values with one being mouldy and the other not.

The most common complaint about mouldy hay is the loss of palatability or refusal to eat it by stock but it is unknown whether this is due to taste, dustiness, or loss of feed quality, but all are likely factors.

Little research has been undertaken to look at the effect of mouldy hay on animal performance.

One feeding study conducted at the University of Manitoba saw four-month-old Holsteins heifers were fed lucerne hay at three different levels of total fungal biomass (1.7%, 3.2 % and 4.3%), remembering that hay made under ideal conditions can contain 1-2% total fungal biomass.

In this study, the young heifers could eat as little or as much as they wanted. Intake was 40% lower for the heifers that were fed hay containing high levels of total fungal biomass.

'Cattle can tolerate slightly mouldy hay if introduced slowly or if diluted with other better quality feeds.'

How to prevent mould development

There are several active management options.

Fungi are always present in the windrow and in the bale. To minimise further mould growth is to do the obvious, bale hay at the recommended moisture contents (see Table 1).

Yes, everybody knows that and it is much easier said than done. However, equipment manufacturers have developed machines such as tedders and mower conditioners and are continually trying to find the perfect combination.

A not-so-common technique, well-utilised by many in silage making, is to ted or spread the mown crop as soon as possible after mowing to increase the rate of water loss while the stomata are still open in the leaves.

This can reduce the curing period by at least one to three days, depending on factors such as yield, curing conditions and soil moisture.

Mower conditioners with swath boards left as wide as possible can also save a day or so. Using tyned-type tedders in pastures can leave a fluffier windrow compared with the roller types, although these are required for stemmy crops such as sorghum and lucerne.

For lucerne crops only, hay desiccants such as potassium or sodium carbonate can reduce curing time by partially dissolving the waxy cuticle on the stem allowing it to dry down faster, but climatic conditions can influence its effectiveness.

More commonly used is a hay preservative. These limit microbial growth that contributes to heating and as well as restricting mould growth.

This allows hay to be baled sooner, slightly more moist than recommended, with reduced concern for heat or mould growth. The most effective preservatives are organic acids such as propionate and acetate, which are very acidic, or more commonly used now, their derivatives such as sodium diacetate, which are less corrosive or dangerous to operators.

It is crucial to remember preservatives have to be added at recommended rates on a fresh weight basis but the potential for damage during storage will increase at higher moisture levels. Some bacterial inoculants are another method to potentially reduce mould growth. There are naturally occurring bacteria that can inhibit the growth of fungi in the windrow and after baling.

The aim of inoculants is to deliver sufficient numbers of these beneficial bacteria to inhibit the mould-causing fungi and out compete the bacteria that contribute most to heating.

In some cases bacterial inoculants have shown good results but sometimes they have not substantially reduced mould growth.

If using a total mixed ration (TMR) wagon for mixing mouldy hay with other feed ingredients, there are some products that can be added to the mix that can reduce the potential for mycotoxin toxicity

Bottom line: Cattle can tolerate slightly mouldy hay if introduced slowly or if diluted with other better quality feeds, however, avoid feeding mouldy hay to pregnant animals. D

Maintaining silage quality at feed out

Key points

- Reducing exposure to air key to retaining silage quality
- Aim to maintain tight feeding face in pit silage
- Insert plugs in in-line continuous wrapped bales

By **Pat Bloye**
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Warrnambool, Victoria

Figure 1: The use of a block cutter can help maintain a tight feeding face of the silage stack.

THE silage-making process, either done by the farmer or a contractor will cost money and time. The greater the losses of quantity and quality, the more expensive the silage becomes.

Making high quality silage can take an enormous effort, with contractor availability and/or weather conditions making successful timing difficult.

However, making high quality silage is only part of the process. The key is to maintain silage quality to ensure that it's still potentially profitable by the time it goes down the cow's throat.

If the losses of dry matter (DM) can be minimised and quality is maintained through relatively simple and well-proven techniques, more money stays in the farmer's pocket.

Success of the ensiling process and maintaining a stable phase during storage is dependent on keeping the air out. In the silage world, air is the enemy at all stages from cutting to feeding out.

When plant sugars are exposed to air, non-desirable aerobic bacteria, yeasts and moulds (the 'bad' bugs) will get to work, breaking down the silage. The first indication of silage decomposition is the production of heat. Hot, steamy silage indicates non-desirable microbes are consuming the plant sugars, producing heat, carbon dioxide and moisture in the process. Once this is happening, the silage will be losing quality and become less palatable to livestock. ▶

Figure 2: Clean, tight feeding face, minimising air infiltration into the stack.

◄ If feeding out individually wrapped silage bales, decomposition during feed out won't be an issue, unless feeding out two or three days in advance. When feeding out stack/pit/in-line wrapped silages, there will be a period where the silage is exposed to air before feed-out. There are some relatively simple and cost-effective techniques that can reduce the air infiltration into these silages, reducing consequent breakdown.

In an ideal world, once the silage is opened it should be fed out as quickly as possible to reduce the extent of air exposure. The feeding rate of silage is dependent on many factors, such as cow requirements, pasture growth rates, production targets and silage face area. Therefore it isn't always possible or practical to feed it out at a rapid rate.

Below are a few tips that may help reduce losses:

- When uncovering the stack, don't peel the plastic back any further than is needed. If it is peeled back more than is needed, a greater surface area of the stack will be exposed to the air.
- Don't cover the face of a stack if being fed out daily unless wind is blowing directly into the face. Covering the face traps the heating air, which essentially works like an oven, causing further heating and encouraging growth of non-desirable microbes.
- Leave a tight face on the stack and consider what equipment may be needed to achieve this. A tight feeding face will reduce the potential for air to penetrate into the stack.
- Although a hydraulic fork grab is generally cheap and easy-to-use (horsepower wise), it is hard to achieve a tight feeding face with it. Block cutters/shear grabs (see Figure 1), albeit more expensive, have the ability to leave a tight feeding face on the stack and can significantly minimise losses during feed-out. Furthermore, block cutters/shear grabs can result in a more consistent volume of silage per grab.

If using a bucket for feeding maize silage, rather than lifting out loads from the base of the stack (and lifting the compacted silage upwards), try starting at the top and scraping the maize down, then scooping up the loosened maize off the base with the bucket. This will minimise the disturbance of the compacted stack.

- If there is a significant period during which silage will not be fed from the stack, leave a clean nearly vertical face (see Figure 2) and re-cover as soon as possible, removing as much air as possible by weighting the cover with tyres, gravel bags and soil. Sealing along the stack sides is important, as this is where resealing can often prove unsuccessful.

'In the silage world, air is the enemy at all stages from cutting to feeding out.'

For maize, whole-crop cereal silage and silage that is known to be fed out slowly, consider the use of specific additives during the silage harvest to delay the onset of heating at feed-out.

These additives are referred to as aerobic spoilage inhibitors. During a successful fermentation process, plant sugars are converted into lactic acid by lactic acid bacteria (LAB). This results in a subsequent pH drop — an increase in acidity.

Such a build-up in acidity reduces the activity of non-desired microbes. These microbes are not killed during the process, but are more or less 'put to sleep'. When the silage is re-exposed to air, these 'bad bugs' become active again.

Through the use of inoculants containing *Lactobaccilus buchneri* 40788, acid salts and a few other products, aerobic stability of the silage can be increased by several days during the feed-out phase. These additives slow the rate at which the non-preferred microbes can get 'back to work'.

Figure 3: Development of mould at the interface of in-line wrapped square bales.

- If silage feeding rate is normally low at most times of the year (smaller herd size, lower stocking rates) consider making narrower and longer stacks at harvest time to minimise the time and area of exposure to air.
- For in-line continuous wrapped bales, insert plugs in the line when wrapping. These could be individually wrapped bales (although unlikely given the in-line method used) or specific plastic caps now available from some manufacturers.

Remember to mark where these plugs or bales are along the tube line. This will reduce extensive silage breakdown should the feed-out need to slow or stop.

A common fault of in-line large square bales, wrapped two bales high, is that air moves down the line at their interface (see Figure 3). Consider making shorter runs to minimise the damage further down the line.

The key message is to minimise the exposure of silage to air. In the presence of air, non-desirable bugs will cause the silage to deteriorate leading to decomposition across time, reducing quantity, quality and profit. D

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Tips for buying silage inoculants

Key points

- Understand uses for different types of inoculants
- Independent research should back claims
- Choose product form to suit job

By **Frank Mickan**
Department of Economic Development, Jobs, Transport and Resources
Ellinbank Centre, Victoria

SILAGE inoculants can be confusing for many farmers: "The bugs in their silage inoculant product won't work compared to those in mine."

"My silage doesn't look any different with inoculant use so why apply it?"

"Some manufacturers claim that a million CFUs are needed while others say 300,000 CFUs are enough and others only 100,000."

"The labels can be very confusing and vary in detail and units between products."

Microbial inoculants can make silage fermentation more efficient, thereby preserving more nutrients and dry matter and often improving animal performance. Some inoculants have been developed recently to specifically improve aerobic stability. Both categories of inoculant are important in substantially reducing nutrient and dry matter (DM) losses in silage stacks and bales.

However, there are so many silage inoculants and claims about them it is not surprising farmers and contractors are often confused. Be aware products use different means to achieve results: efficient fermentation or delayed spoilage.

All the above issues and many others make comparing products difficult and to sort out which product could work in a given situation. Confusion is increased due to misinformation promulgated by some additive sales people.

Even among the reputable manufacturers of the various silage additives, there is healthy competition as each espouses the pros of their products and the cons of other companies' products.

To help minimise some confusion, the key factors to consider when buying a silage inoculants are:

1. Type of bacteria;
2. Number of effective bacteria;
3. Availability of independent research;
4. Purpose of the additive;
5. Suitability of product form dry vs wet vs pre-incubation; and
6. Quality of packaging.

Figure 1: A liquid inoculant being sprayed from above and jetted from below.

1. Type of bacteria: Fermentation-enhancing inoculants usually include homolactic, heterolactic and sometimes propionibacteria bacteria. I'm not going to confuse further by explaining these terms.

> ***'There are so many silage inoculants and claims about them it is not surprising farmers and contractors are often confused.'***

The bugs most commonly used in silage inoculants include the classical homolactic acid bacteria such as *Lactobacillus plantarum, Enterococcus faecium* and several species of *Pediococci*.

These improve the initial fermentation stages by speeding up the production of lactic acid and constraining the production of undesirable end products that may reduce the efficiency of fermentation.

Some silages are prone to aerobic deterioration resulting in large dry matter and nutritive values losses in storage, which is actually due to poor shelf-life (not just fermentation losses).

Many studies have been conducted to improve the aerobic stability of silages. To date, and this could change with further research, of the heterolactic acid bacteria studied, only *Lactobacillus buchneri* has been proven by independent research to be an effective inoculant to delay the onset of aerobic deterioration. *Lactobacillus buchneri* on its own has minimal effects on the initial fermentation process, but converts moderate amounts of lactic acid to moderate amounts of acetic acid during storage, which inhibits the growth of yeasts and moulds.

Some silage inoculants contain a mixture of bacteria, which, in some research, have led to improved efficacy, but not all combination of inoculants are better than an inoculant with only one organism. However, recent research with products containing the homolactic acid bacteria and the heterolactic organism *L buchneri* to provide stimulation of early fermentation and prolonged shelf life during storage and feedout have been successful.

2. Number of effective bacteria: This ▶

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Figure 2a: An example of a granular inoculant.

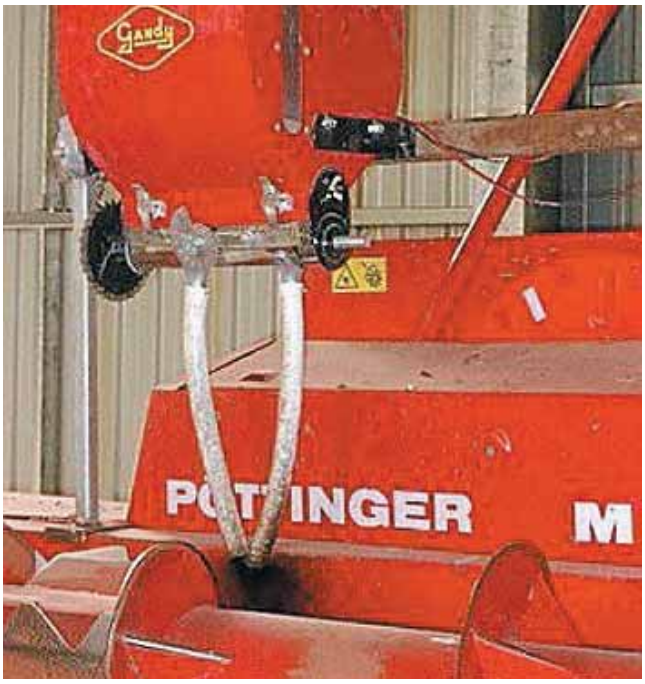

Figure 2b: A granular inoculant applicator.

◀ can be confusing. To be effective silage inoculants must be applied at a rate high enough to compete against detrimental bacteria, moulds and yeasts and dominate the fermentation process.

For homolactic acid bacteria, the industry recommends a minimum final application rate of 100,000 colony forming units per gram (cfu/g) of fresh forage. A colony-forming unit describes the number of bacterial colonies that can be counted on a predefined area on a culture plate.

In some inoculants containing *L buchneri*, the recommended application rates needed are 400,000 cfu/g for pasture silages and 600,000 cfu/g for high-moisture corn.

Never add half the recommended rate to save money as this substantially decreases the probability of the product working. Also don't add more product than recommended as this makes the inoculant needlessly expensive.

Ensure the correct rate per fresh tonne is applied, especially when forage is on the wet side.

The number of bacteria is referred to in several ways by different companies and in terms such as logarithms or log (measures used by scientists), adding to the confusion. The use of logarithms provides microbiologists with a method to easily indicate cfu/g without having to write out the number in typical numerical form.

Logarithms (logs) are written in the following fashion: For example 400,000 cfu/g would be expressed as 4×10^5 where the number above the 10 is the number of "0s" to the right of the number before the 10 (four in this case). Sorry for the technical terminology but it may be useful for determining application rates on various inoculant packages.

3. Availability of independent research. An effective silage inoculant will have undergone independent (non-company) research with the re-

sults suitably analysed and published with data to support its use.

Due to a large variation in research results for many reasons, the greater the support data available, the more credible the product.

Be aware brochures from some companies show "research data" from many university studies that have not been published.

No inoculant works all the time, but the better ones do work a high proportion of the time. Companies with high integrity will discuss both the positive and negative results and the pros and cons of their product.

4. Purpose of the additive: Many companies have developed specific bacteria, bacterial mixes and some even have specific strains of bacteria in their products.

The reputable companies have developed these and often, but not always, with specific crops in mind. This would have been based on their own and usually independent research. Don't just assume that anything with "inoculant" in the name will necessarily do the job.

5. Suitability of product form: Inoculants come in various forms — liquid (see Figure 1), dry granules (see Figure 2a and b) or a product needing pre-incubation. Research has shown dry granular inoculants to be satisfactory until the dry matter content exceeds about 50% DM (50% moisture).

Liquid types cover the material more evenly and start the fermentation process more rapidly as it is already in liquid compared with granules relying on the being moistened by forage juices before they grow.

The granular form is less ideal on balers as some is likely to be lost through the bottom of the pick-up or throat of the baler.

Figure 3: Heat-sealed packaging helps retain the quality of the inoculant.

Although all inoculants must be handled strictly as instructed, products that require pre-incubation, ie mixing in a supplied substrate and left for a specific time period before application, may need extra attention to detail.

Most liquid products, once mixed, need to be used within 24 hours. If the excess is not thrown out and a fresh batch added to the last day's mix, a build-up of dead bacteria may occur that may affect spray jets.

6. Quality of packaging. Look closely at the packaging. Are the containers sewn or heat-sealed (see Figure 3)? Sewn bags can allow moisture in, which is detrimental to the bacteria.

The product should be packaged in moisture-proof packaging for long-lasting shelf-life. Importantly, check expiration dates, date of manufacture and lot numbers. These show professionalism of the manufacturer by taking special care in tracking the age of the product. Be aware that products containing live bacteria do expire, regardless of the type of packaging.

This article has not discussed the many management factors that are also major causes of inoculant failures.

Wrapped silage bales advances

Key points

- Changes in wrapped silage technology
- Be aware of film colour, prestretch, layers
- Oxygen-barrier film under development

By **Frank Mickan**
Department of Economic Development, Jobs, Transport and Resources
Ellinbank Centre, Victoria

THE days when wrapping silage bales was simple and straightforward are gone. Now the marketplace features older stretchwrap films, newer film resin and new manufacturing technology.

There are stretchwrap films with different characteristics, different thicknesses ranging from 12 micron through to 30 micron, recommendations by different manufacturers to apply four, six or even eight layers of film and different amounts of pre-stretch before going on to the bale.

Bale size and weight have increased substantially with improvements in balers and combined baler/wrappers and various types of wrappers. All this has created some traps for the unwary.

Air is still the enemy of silage, and changing the film type, pre-stretch amount and number of layers will all have an effect on the film's permeability and therefore ability to prevent oxygen transfer. Remember, there are no short cuts when wrapping round or square baled silage.

Round bale weights now vary from about 500 to nearly 1000 kilograms wet weight, depending on bale size, dry matter (DM) content, baler used and operator input.

Figure 1: Film on darker bales damaged by reflected sun heat on both bales.

Most round bales of silage are still about 1.22 metres in length but diameter can vary from 1.22m to 1.37m with some and approaching 1.52m.

Films: The ultimate stretchwrap film must be strong, resistant to tearing and puncturing, have consistent elasticity during application, anti-UV degradation and sufficient tack (glue) to cling in all situations and guarantee against UV degradation for at least 12 months.

Bales should have no mould at opening, and the quality of the forage going into the bale should be similar to that being fed, notwithstanding there will be some losses due to fermentation.

Manufacturer's recommendations for the pre-stretch amount and the number of layers should be followed to ensure compliance with the film guarantee offered.

Pre-stretch setting: Stretchwrap films used to be pre-stretched about 55% as it was being applied to the bale. Now some companies with their particular brand of film are recommending a 70% stretch, which requires another set of gears for the pre-stretcher.

Most wrappers mark somewhere on their machine the percentage of pre-stretch although this is no help if gears are changed at some time.

There are also some films where

Table 1: Number of layers to be applied to various silage bale forms.

Film type and gauge (micron, µm)	% Stretch	Individually wrapped bales		Continuous In-line wrapped bales	
		ROUND bales[1]	RECTANGULAR bales[2]	ROUND bales[3]	RECTANGULAR bales[3]
Three Layer: 25µm x 750mm x 1500m	55%	Minimum of 4	6	6	6
Five Layer: 25µm x 750mm x 1500m	55% or 70%	Minimum of 4	6	6	6
Pre-oriented: 21µm x 750mm x 1900m	55% or 70%	Minimum of 4	6	6	6
Pre-stretched 3 layer: 14µm x 730m x 2600m	35%	Minimum of 4	6	6	6
Pre-stretched 3 layer: 16µm x 730m x 2300m	55%	Minimum of 4	6	6	6

[1]Apply 2 extra wraps on stalky crops + potentially extra 12 mths storage. 6 layers also recommended for bales to be handled and/or transported
[2]Apply 2 extra wraps on stalky crops + potentially extra 12 mths storage. 8 layers is also recommended for bales to be handled and/or transported
[3]Apply extra wraps at the joins.

some pre-stretching is carried out in the factory requiring less stretch at the bale but it also requires a new set of pre-stretcher cogs.

Not in Australia yet but no doubt will be in the near future is an equipment supplier recommending a 90% pre-stretch with 70% still being an option.

'I still maintain that four layers of a high quality three or five layered stretchwrap film applied to individual bales with the correct stretch and at least a 50% overlap will store round bales satisfactorily for 12 months.'

Number of layers applied: Another major confusion surrounding the use of stretchwrap film is the number of layers to be applied to individually wrapped round and rectangular ("square") bales and continuous in-line wrapped rounds and squares.

Different messages are given by the many equipment suppliers, service providers, consultants and government advisers such as myself involved in providing advice to the silage production industry.

Table 1 provides recommendations as supported by most manufacturers and advisers.

Three and five-layer film technology: Gone are the days of single layer or cast film, replaced initially by three layer film, which allowed ultra-violet (UV) light inhibitors and UV stabilisation features and tack-and-glue to be applied between the layers to provide a film of many benefits over the original.

Now, some manufacturers have produced five and even seven layered films stipulating 70% stretch and varying numbers of layers depending on application.

Colour of film: A perennial argument by the sellers of film. There is little doubt that the lighter colours are advantageous in areas where temperatures are high for much of the year but black film is still all right for the cooler climates.

However, it not recommended that darker-coloured bales be double stacked.

Figure 2: Stretch wrap film over netwrap on bale perimeter, before normal wrapping.

An issue has arisen during the hotter months as the sun's heat can be reflected off one bale onto the next causing some degree of heat degradation of the film on the second bale (see Figure 1).

Film on film: Dome balers and com- ▶

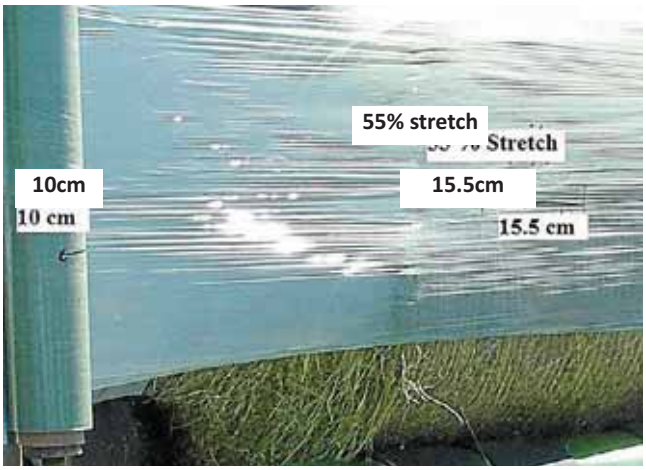

Figure 3: Checking for pre-stretch.

Figure 4: Bale with underlapped wrapping.

◀ bination baler/wrappers may soon be able to apply a film instead of netwrap around the perimeter of the bale. The bale is then wrapped as per normal resulting in tighter bales and less oxygen ingress and enabling all used film to be placed in the same bin for recycling.

Some baler/wrappers can now apply some layers on the perimeter and then wrap as per normal but applying less layers (see Figure 2).

Some issues of which to be aware: Mixing films requiring different pre-stretch treatment with the wrong cogs is a problem.

An example of this occurred when a contractor, on a weekend, ran out of film on a job that was being pre-stretched 70%.

Being a weekend he raced to town and could only get a film that required a 55% stretch. He did not have the requisite gear so the job was completed with the wrong setting.

Most new wrappers now come with gears to allow 55% or 70% stretch but anyone buying a second-hand wrapper must investigate which cogs are on or available with the machine.

The pre-stretch percentage can be measured by counting the number of teeth on the gears or in field by marking a known length on the roll before application, then measuring it after application to the bale (see Figure 3).

The final say: Despite the claims made, all stretchwrap film by its nature will allow some air (oxygen) into the bale sometime after wrapping.

This occurs more rapidly as the film ages, substantially so if the film is underlapped (see Figure 4) and more so if holed or punctured.

Obviously the latest films will be improvements on their predecessors and so adds to the confusion for the end users, farmers and contractors.

In recent years much research and on-ground truthing has been occurring to develop a stretchwrap film with an oxygen barrier film as is now available for stack silage.

Cost and final detailing of the film before release is ongoing but watch this space.

I still maintain that four layers of a high quality three or five layered stretchwrap film applied to individual bales with the correct stretch and at least a 50% overlap will store round bales satisfactorily for 12 months.

I am all for applying an extra two layers as added insurance, possibly slight gains in quality due to less ingress of oxygen and slight saving in weight loss due to a more efficient fermentation and less oxygen entering the bale at all stages.

The extra layers also provide more strength, increased puncture resistance and probably allow an extra 12 months of storage. D

Preserving silage protein content

Key points

- True Protein better measure of feed value
- Protein degradation can occur in ensiling process
- Inoculants can help preserve protein

The use of inoculants can help preserve true protein levels in silage.

THE use of adapted silage inoculants proven to improve the acidification process and silage fermentation and increase aerobic stability at feed-out is an important tool to help preserve the true protein value of grass and legume silages.

At a time when feed represents 40-60% of milk production costs, every gram of nutrient counts. In an article about profitable dairy programs[1], nutrition expert Donna Amaral-Phillips describes forage nutrient content analysis as "the first key step towards developing a sound and practical nutritional program for a dairy business". In an analysis published by the Agronomy Department, Florida Cooperative Extension Service[2], crude protein (CP), along with energy value, was identified as one of the most important nutrients for livestock that could be a limiting factor for performance.

How to assess silage true protein content?

Forage protein content varies greatly according to the crop species, maturity and the soil, including the use of fertiliser. It is, however, important to keep in mind that CP is measured indirectly, based on the total amount of nitrogen in the forage. Thus, CP level represents protein content but also other sources of nitrogen with no feeding value, such as soluble nitrogen and ammonia, both degradation products of proteins. Hence, the actual true protein level can vary for a given CP value.

Ensiling is a common method of forage preservation, and it is typically known that the ensiling process does not alter the CP content of a forage. However, if the true protein content is examined, not the overall nitrogen content (CP), this is different. Indeed, silage fermentation is often a source of protein degradation, known as proteolysis, and, even though it is not visible in the stack CP level, the nature of the nitrogenous compounds present after ensiling can be dramatically altered with important amounts of ammonia (NH^3) and soluble nitrogen.

When produced in excess, these products are detrimental to the animal and lead to a decreasing in performance.

Good practices to control proteolysis in silage

Certain good silage practices can help ensure an optimal fermentation pat- ▶

◀tern and thus lower protein losses. Recommendations to attain this goal include:

Before harvest

1. Fertiliser: ensure a lag time between spreading of manure/slurry and harvesting. Manure/slurry is high in nitrogen and thus increases the buffering capacity of the forage

At harvest

2. Dry matter (DM) content: high DM inhibits proteloytic enzymatic activity. Ensiling at higher DM may minimise proteolysis.
3. Cutting height: proteolytic microorganisms are mainly located in the soil. A cutting height above 6-7 centimetres should limit soil contamination and the presence of these micro-organisms.
4. Use of acidifying inoculants: ensuring a rapid and strong acidification at ensiling quickly inhibits the activity of proteases and proteolytic bacteria. The use of adapted acidifying inoculants, designed for grass forages, accelerates the acidification process, thus limiting proteolysis.
5. Optimal packing and sealing to favour anaerobiosis: the absence of oxygen within the stack inhibits proteases and contributes to a better acidification.

After harvest

6. Avoid silage heating: certain forages, in particular when high in DM, are prone to heating. This can be prevented by the use at harvest of adapted silage inoculants containing *Lactobacillus buchneri* NCIMB 40788, which are proven to prevent mould development after ensiling and silage heating.

Focus on silage inoculants benefits

The benefits of effective silage inoculation on protein preservation has been widely recognised. Various field data and scientific trials assessed the effect of selected microbial inoculants on grass silage protein preservation and found the following:

- Reduced protein loss in grass and legumes: a controlled trial performed in Switzerland (Posieux University, 2008) shows the effect of a product (LALSIL) containing a combination of cellulolytic enzymes with a specific lactic acid bacteria and the patented *Lactobacillus buchneri* NCIMB 40788 on protein loss, as shown by a decreased level of soluble nitrogen at various DM contents when compared with non-treated silages.

'Silage fermentation is often a source of protein degradation, known as proteolysis.'

- Improved true protein content and aerobic stability of legumes: a controlled trial conducted on lucerne (alfalfa) micro-silos (Hungary, 2005) showed that the use of the same product increases acidification kinetics during fermentation, leading to decreased protein losses, and improves aerobic stability at feedout, reducing moulds and losses, but also inhibiting clostridia due to better pH control.
- Reduced protein loss in grass silage: in a German trial (Honenheim University), the effect of a specific combination of enzymes and acidifying bacteria on the fermentation profile of 40% DM grass silage showed an improved acidification process, leading to higher protein preservation.
- Improved aerobic stability in grass silage: a recent field survey conducted by Lallemand (2013) across close to 60 stacks and aimed at assessing grass silage quality on farms, showed that for the LALSIL treated stacks (n=30), there was no increase in average silage temperature above ambient temperature at feedout, while the untreated stacks (n=27) were on average +4°C above ambient temperature.
- Reduced clostridia development in silage. It has been shown that, from a basal contamination level, improved acidification and aerobic stability due to the effect of the inoculant leads to the inhibition of clostridia development within the silo, hence reducing protein breakdown by these micro-organisms.

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The studies showed the use of adapted silage inoculant improved the acidification process and silage fermentation. D

Article supplied by Lallemand Animal Nutrition, phone (07) 5451 0125, website <www.lallemandanimalnutrition.com.au>.

Hay balers: a hidden fire danger

Key points

- Hay baler fires start when baling
- Need to carry extinguisher in tractor
- Do not expel bale if fire starts

By **Frank Mickan**
Department of Economic Development, Jobs, Transport and Resources
Ellinbank Centre, Victoria

EACH year there are stories about haystack fires in sheds and paddocks and the financial loss as a result of these. However, not so commonly known is that there are also many hay baler fires, which start while baling. During every hay harvest, the Victorian Country Fire Authority (CFA) attends several baler fires, many of which could have been prevented or at least contained with much reduced damage.

Not only are balers often burnt in these fires but sometimes the tractor is also partly or completely destroyed; neither is a cheap piece of machinery. No doubt there are other unreported costs such as paddock fires caused by the baler fire spreading into nearby windrows and surrounding dry paddocks, especially if there is wind.

'It is compulsory by law in Victoria for all tractors to have a water extinguisher with a minimum nine-litre capacity attached to the tractor during the fire restriction period.'

There is also the dangerous prospect of serious burns to the operator. Then there is the potential loss of animal production due to the delay in baling until another baler is put into action and, worse, if it rains beforehand, causing substantial loss in nutritive value of the hay.

While having a chat with a local passionate CFA member, who is also a farmer and with input from some other farmers at the same time, they mentioned many insights that I felt should be put out to the farming community. Some of these insights are well known but some are relatively unknown.

Most baler (and tractor) fires are caused by over-heating of usually damaged bearings and are often not noticed until the hay bale and baler are well alight, unless the operator just happens to turn around when the fire first starts.

What should be well known by farmers and contractors is that it is compulsory by law in Victoria for all tractors to have a water extinguisher with a minimum nine-litre capacity attached to the tractor during the fire restriction period. This can be either a pressurised water extinguisher (see Figure 1) or a knapsack, although the latter is difficult to attach on many late-model tractors. ▶

Figure 1: Tractor water extinguisher.

Figure 2: Thermal gun.

◄ Unfortunately, this law is poorly enforced, but this simple tool is a no-brainer when operating equipment with hot bearings in hot, dry, windy conditions in dry flammable grass. It can potentially save expensive machinery from burning, making it cheap insurance. An extinguisher could be critical to nipping a baler fire in the bud or at least delaying it spreading too much before the CFA arrives, notwithstanding sparks caused by mowers and so forth hitting stones or metal.

The CFA also recommends carrying a minimum two-kilogram dry-powder extinguisher for several reasons. These are useful for electrical and hydraulic oil fires, which often start as a result of the baler fire melting wires or hydraulic hoses. Embers often are blown into nooks and crannies around and under the tractor cabin and in other hard-to-get-at places. Spraying water into these spots sometimes does not reach all crevices or deep enough where dust and loose dry material has built up. The water can sometimes evaporate before extinguishing the fire in some locations. A powder extinguisher will spread further and is more effective in these scenarios than water.

Electrical shorts can also start fires and even though the electrics are usually automatically shut down on many of the latest-model tractors, fires can sometimes short-circuit this safety process. Water won't extinguish this fire.

Some other handy tips from the CFA include:

• Clean the tractor each day to minimise the build-up of flammable material. Although this will occur during the day's harvest operation, the less build-up of loose, dry material, the better. Dust and loose dry grass builds up in nooks and crannies and can lodge near hot tractor parts such as the engine manifold, exhaust and turbocharger.

• Get a handle on the normal operating temperatures of the bearings once the baler is in full operation by using a thermal gun ranging in price from $30 to several hundred (see Figure 2). This is not fool-proof and a bearing may give out suddenly without warning. Replace any bearings that are running hotter than normal. Be aware that the latest balers run at higher temperatures than the earlier models.

• Seriously consider changing sets of bearings when one is showing signs of wearing out. The bearing in the opposite one end of the shaft to the worn bearing may not be far from wearing out itself and it is highly likely that the increased wear may have been caused by its faulty mate at the other end. Replacing bearings is much cheaper than replacing a baler (and/or tractor).

• If a fire is noticed in the bale chamber, or smoke can be seen coming from a bearing, the CFA — based on many years of experience — strongly suggests NOT ejecting the bale from the chamber. While being ejected the bale suddenly becomes exposed to much more air and the loose material inside and around the baler can seemingly "explode" into flames once the baler is freed from its tight air-restricted confines. Also, depending on the strength and direction of the wind, this newly inflamed material may be blown into the tractor and cabin crevices as explained above.

• The tractor should not be sped up in the hope of extinguishing the flame as the flush of air will actually fuel the flame and often just spread the fire into the paddock itself.

• The CFA strongly recommends separating the tractor from the baler as soon as possible, because baler fires more often than not get out of control quickly. This rapidly generates extreme heat so that approaching the drawbar will become almost impossible (without a risk of severe burns) and metal components heat quickly, making uncoupling of hydraulic hose very difficult and extremely dangerous if this has not been attended to immediately. If there is no extinguisher available, this is a must to avoid having the tractor destroyed as well.

• The CFA, through its website, recommends preventing the overloading of electrical circuits by using the battery isolation switch, if fitted, whenever the harvester is parked. It also recommends the use of vermin deterrents during the down period as rats and mice can chew through electrical insulation, resulting in short-outs.

Care is also needed when driving vehicles with hot exhausts or even hotter catalytic converters over long dry grass or windrows. D

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Embracing the unexpected

By **Kerry Ryan***

Key points

- ✔ Budget with price and cost ranges
- ✔ Learn from history of physical and financial performance
- ✔ Let go of things beyond immediate control

Taking the opportunity to lock in prices for some inputs and part of production gives the ability to fix trading margins.

RECENT events confirm unexpected change and volatility have become the norm for farming. They highlight the importance of farming operations getting better at measuring the impact of new scenarios for active risk management and enhanced business resilience.

While this requires more detailed planning, the benefit is increased agility to respond to the unexpected in a positive way.

Current fluctuations in New Zealand dairy prices are a prime example. After record returns last season, prices have now slumped well below the cost of production. This contrasts with the positive forecasts and sentiment about prospects for dairy returns that have dominated industry and media forums in the past few years. Understandably, many are struggling to integrate this new trading environment into their budgets and strategic plans.

No matter how well businesses have done their homework, few will have anticipated the extent of change being experienced. It seems we are in a phase where the randomness of the factors influencing markets demands a rethink of traditional forecasting techniques.

Success with this relies on a mix of planning for the future, learning from the past while striking a balance between "controlling the controllables" and letting go of those things beyond immediate control.

To be effective, budgets must be based on credible assumptions for business performance and market trends. To accommodate volatility these now need to be calculated on product price and cost ranges rather absolute estimates. This enables quick assessment of the impact of change through budgets that measure "sensitivities" rather than "certainties".

Until now farming businesses have been relatively one-dimensional in their focus on product prices as a determinant of profit.

This risks incomplete assessment of business outlook compared with budgeting that places more emphasis on trading margins. Awareness of cost structures against the impact of changing product prices on profit is increasingly important.

'Another component of effective forecasting is the ability to learn from history.'

Another component of effective forecasting is the ability to learn from history. This applies to everything from climate trends to physical and financial performance. Obviously technology can make a significant contribution here, however, I have seen many situations where people have had simple but effective manual-recording systems for what's happened on farm.

This enables identification of similarities between emerging scenarios and past events. Such information can contribute to a pragmatic "been there, done that" philosophy around challenging situations. It reminds farming operations that while the circumstances confronting their business may be unexpected, they are often not that different to many of the things that have been overcome in the past. Recognising this increases confidence and self-belief to overcome adversity.

The final ingredient is commitment to "controlling the controllables". This means focusing on areas of influence and not getting caught up in issues that are beyond the operation's direct control.

An option that is only slowly being adopted by New Zealand operators is the ability to fix trading margins. This involves having certainty around key contributors to cost structures and product prices. An example of this is the recently introduced option to secure guaranteed milk prices for a portion of supply as offered by Fonterra in the past couple of years. It is interesting that this is reported to have been undersubscribed.

Taking opportunities to fix revenue complemented by active management of fixed interest rates and contract rates for feed inputs is likely to be "business as usual" for farming in the future.

This more comprehensive approach to forecasting will enable a more agile and timely response to "left-field" events. We can no longer rely on extended lead times that enable anticipation of negative trends. It's now a matter of defining what these might be and designing response strategies that can be implemented at short notice.

When this is combined with a "no surprises" culture built on high-quality banking relationships, best practice staffing strategies and credible professional advice, this strategy can significantly strengthen the business.

Yes, farming is becoming more complex. The big payback from these systems is development of farming operations that can move quickly to capture opportunity that would not exist without change. D

**Kerry Ryan is a New Zealand based agribusiness consultant available face-to-face or online for advice and ideas. Contact him at website <www.kerryryan.co.nz>.*

Lepto — are your workers protected?

By **Sherri Jaques***

Key points
- ✔ Leptospirosis spreads from animals to humans
- ✔ Can cause serious illness
- ✔ Vaccinate herd to reduce risk

LEPTOSPIROSIS (Lepto) is a group of bacteria that infects the kidneys and urinary system of mammals. In the early phase of infection Lepto can also affect most other body systems including; the mammary glands (mastitis), reproductive (infertility and abortion), liver (jaundice), lungs (bleeding in the lungs) and the nervous system (headaches, shakes, eye pain) typically with fever, lethargy and muscle pain in the early stages.

There are many types of *Leptospirosis* found in Australian mammals, however, only two commonly found in cattle: *Lepto. Hardjo* and *Lepto. Pomona*. Both of these are covered by the commonly available vaccines.

Lepto is spread mostly via infectious urine (or other body fluids) from often symptom free-carrier cattle, pigs, rats, dogs and other mammals. Lepto is zoonotic, meaning that humans can catch it from animals.

Breathing in, or contact with, the 'urine mist' formed inside the dairy is a recognised health hazard to dairy workers. This bacteria can be absorbed into the body through the eyes, nose and mouth.

In many states occupational health and safety legislation requires that dairy herds be fully vaccinated to protect dairy/farm workers, owners and veterinarians. There is no vaccine for people.

In a later edition I will discuss the many effects of Lepto infection in the herd but this article I will focus on the signs of human infection, which are often mistaken for flu by those infected. Signs of Lepto infection in people, listed from common to uncommon, can include:

- "Flu signs" — painful muscles, eyes, headaches, rash, fever and lethargy.
- Jaundice — yellow tinges to the white of the eyes and the skin due to liver infection. This is why it used to be called 'yellow fever'.
- Lethargy — this can become a chronic lethargy that can last several months in some cases.
- Respiratory — an often fatal bleed from the lung tissue.
- Nervous signs — including shakes and tremors.

If anyone feels they have signs of Lepto infection, they should seek medical attention from their family doctor.

Lepto survives well in the environment, particularly if there is high humidity or in stagnant water or ponds. As there is no human vaccine for Lepto, the control stratagies revolve around sanitation or hygiene (wearing gloves and washing hands before eating), controlling rat numbers, limiting access of cattle urine or calving fluids to the eyes, nose or mouth (brimmed hats in the dairy and gloves) and vaccinating cattle.

In animals that survive the initial infection (often with little clinical signs), the infection tends to eventually localise (or hide) in the kidneys, and the bacteria is intermittently excreted in the urine, sometimes for long periods of time.

'Avoid litigation, look after yourself, workers, vets and protect the herd and calves — vaccinate for Lepto, every beast, every year.'

Sometimes it can be grown in the laboratory from urine samples, but as the numbers in the urine tend to go up and down, and the bacteria is hard to grow, false negatives are common. Often blood samples a few weeks apart are taken looking for rising antibodies. Material from a freshly aborted fetus can sometimes be sent to the laboratory for confirmation of Lepto.

Vaccinating a cow that is a long-term carrier and spreader of Lepto will not remove the bacteria from the cow's kidneys. Those that are vaccinated young, before infection will be immune as long as they are vaccinated properly. Clinical cases that have been identified can be treated by a vet with antibiotics to clear the bacteria from the kidneys, however, many cattle show few signs of infection and may escape treatment.

Breathing in, or contact with, the 'urine mist' formed inside the dairy is a recognised health hazard to dairy workers.

Lepto vaccine is an under-the-skin vaccine that is given to animals at three to four months of age. Any animal being vaccinated for the first time (calves and new stock) requires a booster four weeks after the first injection.

Calves can be vaccinated from six weeks if Lepto has been diagnosed as a problem on the farm. If the first dose is given early at six weeks-of-age, boosters one month and six months later are required. Lepto vaccine then needs to be given every year.

The vaccine is safe to use during pregnancy and recommended to be given at drying off to ensure high levels of protection in the colostrum for the next batch of calves (this lasts about six weeks). During outbreaks of infection, veterinarians may recommend the vaccine be used every six months.

Avoid litigation, look after yourself, workers, vets and protect the herd and calves — vaccinate for Lepto, every beast, every year.

Until next time, happy milking. D

*Sherri Jaques is a practising veterinarian and reproduction adviser in the West Gippsland region of Victoria.

All comments and information discussed in this article are intended to be of a general nature only and may not be suitable for individual herds. Consult veterinarians for herd health advice, protocols and/or treatments that are tailored to a herd's particular needs.

Health index ticks the boxes

Key points

- ✔ Breeding priorities evolve with herd development
- ✔ Fertility and cell count now key criteria
- ✔ Health Weighted Index suits this objective

Jason Bermingham says the new Health Weighted Index ideally suits his breeding objectives.

JASON and Casey Bermingham's breeding goal has always been fairly consistent: to breed cows that will have long, productive lives in their herd. However, during the past 10 years their selection priorities have evolved as their herd developed.

The couple dairies near Maffra in East Gippsland, Victoria, milking 240 cows under a pasture-based system. Mr Bermingham said 60% of the herd calves in spring and the rest in autumn, averaging nearly 8000 litres per cow.

Mr Bermingham said their breeding decisions were initially focused on production. "But as production improved, we turned our attention to the type traits that influence longevity in our herd, particularly udders and feet and legs," he said. "We've got to the point now where the herd is pretty consistent for production and type."

A recent Genetic Progress Report on the herd helped Mr Bermingham further refine his breeding priorities.

"Our report confirmed we'd made good genetic progress for production and type traits but it also highlighted the opportunity to improve on health traits such as fertility and cell count," Mr Bermingham said. "We had already started paying more attention to fertility but the report really brought the message home."

When the three new breeding indices became available with the April ABV release Mr Bermingham discovered that the Health Weighted Index was a good reflection of his breeding priorities.

"I know that all the bulls on the HWI list will improve overall production, with extra emphasis on fertility, cell count and feed saved and this matches what we want to achieve in our herd," he said.

"Fertility and cell count are the main reasons we cull cows so they have a very big impact on longevity in our herd."

To create his initial short-list Mr Bermingham reviewed sires on the HWI list looking closely at each bull's Australian Breeding Values (ABVs) for fertility and type traits such as udders and feet and legs.

"I prefer to use sires with an Australian proof because it's based on the performance of their progeny under Australian conditions," he said.

Mr Bermhingham discusses his short-list with a breeding adviser, who develops a selective mating program for the herd.

> ***'Fertility and cell count are the main reasons we cull cows so they have a very big impact on longevity in our herd.'***

"Before we sit down I always create a list of potential bulls," he said. "It's a good place to start our discussions. From there we look at potential inbreeding and my traits of interest."

Mr Bermingham tries to limit the bull team to about four bulls each joining period. "Selective mating can complicate the logistics of artificial insemination (AI) but we find it manageable if we don't have too many different sires," he said.

To maximise potential genetic gain in the herd, the Berminghams synchronise and AI their heifers and in recent years have used sexed semen.

"Last year we used fresh sexed semen with good results — 50% conception despite miserable, cold, wet weather," Mr Bermingham said. "This year we didn't get booked in early enough so we are back to frozen sexed semen, but the upside is that we have a bit more choice."

Mr Bermingham is looking forward to being able to track the impact of his breeding decisions through future Genetic Progress Reports.

"It will be really interesting to see how our herd's genetic merit for fertility and cell count change across time in response to selecting sires on the basis of HWI," he said.

Mr Bermingham has welcomed the introduction of three breeding indices. "Having three indices obviously gives dairyfarmers more choice — to identify sires that more closely match their individual breeding priorities," he said.

"But it has also sparked a lot more interest and discussion about breeding priorities. It has really encouraged people to stop and think about what traits are important for their herd and what direction they want to take their herd through breeding."

Contact: Australian Dairy Herd Improvement Scheme extension and education manager, Michelle Axford, phone 0427 573 330, email <maxford@adhis.com.au> or website <www.adhis.com.au>.

Dairy Australia
Your Levy at Work

DairyBase open for business

Key points

- ✔ Web-based system allows financial analysis of farm business
- ✔ Allows comparison with other businesses
- ✔ Resources available to help users

ANALYSING and understanding farm business performance has just got easier as Dairy Australia's new web-based farm business management tool DairyBase is now available. DairyBase helps farmers analyse the resources they have and the way they are using them.

Through comparative analysis it allows farmers to track their own performance across time and compare their performance with other similar farms, according to factors such as farm size, region, production system and rainfall/irrigation availability.

DairyBase is available to all dairyfarmers through levy-funding. It is the first of a new range of farm business management tools and training initiatives Dairy Australia is developing for dairyfarmers.

Dairy Australia program manager Helen Quinn said the key benefit of DairyBase was that it gave farmers and their advisers the information and analysis they needed to have well-informed discussions about farm performance. "This is about having a better understanding of the numbers in the farm business, particularly how the physical aspect of the business relates to the financial," she said.

"They can then discuss topics such as achieving short-and-long-term goals, opportunities to improve operations, how they stack up against other farms, whether their farm expenses are in line with similar farms and what decisions need to be made to improve their position."

How to get started

Dairyfarmers and service providers can access DairyBase through the website <dairybase.com.au>.

The first time a person logs in they will be asked for some details. This allows DairyBase to identify them and provides security around data and information. It doesn't take long and is only required the first time a user logs in.

Steps to get started:

1. Go to website <dairybase.com.au> and click 'Log in'.
2. This takes the user to the log in page. Click 'Please register me as a new Dairy Australia user'.
3. Fill in details and tick the box to agree to Dairy Australia's DairyBase disclaimer and privacy policy. Click 'Register'.
4. A new user application will take 24 hours to process. The new user will receive an email confirmation including 'user name' and password. The user name provided will be the email address.
5. Users can then go to 'Log in' at <dairybase.com.au> and use the user name and password provided.
6. Refer to the DairyBase User Guide, which can be found on the website, to help enter physical and financial farm information.

The website has further resources to help with this process including:

- Getting Started guide for first-time users;
- case studies;
- input check list/preparation guide;
- Frequently Asked Questions; and
- links to recorded webinars and upcoming events.

For further support there is a help line 1800 548 073 or email <dairybasesupport@dairyaustralia.com.au >. D

Contact: Regional Development Programs (see details page 114) for information about Farm Business Management and DairyBase activities and resources.

Get to know the Dairy Australia DairyBase team

Neil Lane, program manager farm business capability
Mr Lane is leading Dairy Australia's strategy to lift farm business management capability and performance across the dairy regions. Contact: email <NLane@dairyaustralia.com.au>.

Helen Quinn, program manager farm business information
Ms Quinn is leading the DairyBase project as part of her focus on farm business information and analysis. Contact: email <HQuinn@dairyaustralia.com.au>.

What is DairyBase

DAIRYBASE is a secure, web-based tool that enables dairyfarmers to measure and compare their farm business. After entering their farm data, farmers can then create confidential and comprehensive farm reports to help them understand the overall financial performance of their farm.

DairyBase will be of great benefit to dairyfarmers who want to reduce on-farm costs, boost profitability and formulate annual business plans. All individual farm data remains confidential to the farm business owner.

DairyBase helps farmers to:

- compare their own farm business across time;
- identify opportunities to drive profit and reduce risk;
- make more informed business decisions;
- generate benchmarks according to farm size, region and production system; and
- create annual reports and forecasts.

Dairy Australia
Your Levy at Work

Taking control of their farming future

Key points

- ✔ Financial analysis critical to understand true performance
- ✔ Helped couple grow farm business
- ✔ Identifies key areas for improvement

NORTHERN Victorian dairy farm owners Tim and Lyndal Humphris make every cent count. The couple monitor expenditure in each area of their business, measure the value from the dollars they spend and regularly identify where to make improvements.

This business focus was borne out of necessity. The Humphrises bought their farm at Tongala, Victoria, as the 2008 global financial crisis (GFC) struck. Mr Humphris had previously worked as a veterinarian based at Kyabram, Victoria, for 15 years.

"One of the most important decisions we made was to undertake financial analysis as our position was precarious due to the GFC, which saw milk prices drop by 40%," Mr Humphris said.

"This meant our equity position went backwards, at one point around just 10%, so for us our goals became all about survival."

'Their key financial business management learning was to recognise the difference between their cash, profit position and wealth position.'

The financial analysis included being a part of the Dairy Farm Monitor Project (DFMP), which collects in-depth financial and physical farm performance data across more than 200 farms nationally.

With the increased business focus has come stronger performance with the operation consistently in the top 25% of DFMP farms for the past several years.

DFMP business reports allow the Humphrises to compare costs across time and against other farms and confirms decisions around such items as feed expenses, labour and animal health.

Tim and Lyndal Humphris have found business analysis and knowing their figures has helped them grow their business in a challenging environment.

Additionally the couple joined a discussion group and completed further financial analysis that was shared among the group.

"When we looked at our performance compared to other farms in the group it was very poor but by doing that we could understand the areas we needed to work on, and we have now come back to the point where we are at about 45% equity so it's a positive."

Mr Humphris said the analysis enabled them to know their business, understand their position and make informed decisions.

Their key financial business management learning was to recognise the difference between their cash, profit position and wealth position, Mr Humphris said.

"In 2009/10 our profit was negative, and we thought we were close to selling up," he said.

"The underlying problem was not enough cows post-GFC in the low milk price year. With not enough cows we were not able to cover our fixed costs. We leased another 100 cows for the next season. This made a big difference to profit. During the next few years we have bred up our replacements and have replaced the leased cows with our own cows.

"Once we had increased herd size in 2011/12, we still felt we were having difficultly remaining viable. It was at this stage when we again did our annual look at our figures, we realised we had cash flow issues, but we were very profitable."

The data has shown that in some years the business had results of Return On Assets (ROA) of 16% and Return On Equity (ROE) of 31.6%.

Farm facts

TIM and Lyndal Humphris
Tongala, northern Victoria
Farm size: 150ha
Herd size: 330 cows

2013/14 season
Effective milking area: 110 hectares
Milk production
557kg milk solids per cow
1382kg milk solids per hectare

Variable costs
Herd cost: $0.17/kg milk solids
Shed costs: $0.17/kg milk solids
Feed costs: $3.33/kg milk solids (includes purchase cost of temporary water)

Fixed Costs
Overheads: $2.13/kg milk solids
Total Cost of Production $5.80/kg milk solids

Goals
The areas to concentrate on following 2013-2014 year were to reduce the amount spent on repairs and maintenance and to grow more feed for the water applied as temporary water price was putting pressure on the cost of home-grown feed.

"It gave us the incentive and confidence to push on and stick to our goals — but we would not have known that if we hadn't done the DFMP data," Mr Humphris said. "I guess each time we analyse our figures we learn something new about our business."

Mr Humphris said DFMP also provided a great handle on the costs in the business.

The initial analysis showed the strengths of the farm were low herd and shed costs although they had a higher percentage of bought-in feed — an area on which they have since significantly improved.

"I know my herd costs are about $80 per cow so that means whatever decision I make about additional vitamins or drench then I can weigh up what further benefit will I get from that decision," he said.

"They are important figures to know in the day-to-day running of the business. We also look closely at the consumption of home-grown feed versus supplementary feed costs. Normally the home-grown feed costs is well below, but this year the costs look likely to increase from $146 to about $240 (projected) due to increases in irrigation water prices so this is going to be a challenge for us in but importantly we know these figures and can address them."

Mr Humphris said importantly comparing their own business and performance figures across time had proven most valuable. However, looking at how they stacked up with other operations in their area was also useful. Looking at other farms presented more a guide for business costs and something for which to aim.

Consultant

Another part of the Humphris business focus is to engage dairy consultant Cameron Smith to assist in decisions related to operational changes.

"We use Mr Smith as a sounding board for any ideas we have and certainly we value his budgeting skills too," Mr Humphris said.

"Before we meet with him he makes us sit down and think things through. We then present our ideas and he may point out options that we had not considered — his opinions are invaluable to the business."

Future goals

After a tough introduction to dairyfarming, where making it through the season was the objective, wealth creation and lifestyle are now the goals.

Mr Humphris said the dairy industry was a good industry for wealth creation and the couple were in a better financial position than they were after 15 years working with the veterinary practice.

"I really enjoy dairyfarming and it's a good lifestyle but I don't want to be in the positon where I'm working so hard that the kids say dad was never home when were young so, for example, we changed to seasonal calving where we might lose some dollars but we have the benefit of having a bit more time," he said.

Factbox DairyBase

DAIRY Australia has now launched DairyBase providing dairyfarmers, service providers and industry with a national database of Dairy Farm Monitor Project (DFMP) data and other datasets from consultants and other service providers

Tim Humphris said using an annual financial review like DairyBase was part of good farming practice and should be a part of an effort by farmers to become better at business.

"Farm business management and analysis is definitely a focus for our business, and I would highly recommend other farmers consider getting involved in DairyBase as I expect it will be similar to our experience with DFMP," he said,

Mr Humphris said collecting the required information was not arduous as it was mostly collected throughout the year anyway and the value derived from it far outweighed the time invested in getting it in order.

"By using the tool you are also applying the same measurement as everyone else so you confidently know that you are comparing apples with apples when you are comparing across farms," he said.

"I also think DairyBase will be useful for farmers who don't want to join a discussion group and disclose their results to the group. In saying that I think you do get a lot of value out of discussing issues with other farmers."

DairyBase good news for farmers

DAIRYBASE is going to create more opportunities to improve profitability on dairy farms, according to Victorian dairyfarmers Simon and Lauren Finger.

The couple, who milk 450 cows at Yannathan in Gippsland, said they were looking forward to using the new web-based farm business management tool.

"We already do some comparative analysis with other farms within our discussion group but that is only a small number of farms so it will be useful to have a wider data set of farms to compare with," Mrs Finger said.

"Once we enter our data it will also be useful to compare our performance across time to clearly see what effect the changes that we have made to the operation over the years have helped our profitability."

Mrs Finger said dairyfarmers faced an increasingly volatile environment including the rise and fall of milk prices, unpredictable weather patterns and variations in input prices.

Against this backdrop of constant change having tools such as DairyBase to help farmers gain a greater understanding of their business was crucial to being resilient, flexible and profitable.

Simon and Lauren Finger plan to use DairyBase to help guide their decision making to ensure their farm business is profitable.

Mrs Finger said financial management was always top of mind on the farm and drove all of their decision-making. "We are very conscious about our costs," she said.

"If we are going to feed another kilogram of grain then we do it because it is going to be a profitable move — so DairyBase will give us more information to help make decisions like this."

Dairy Australia
Your Levy at Work

Dehorning calves humanely

Key points

- ✔ Videos demonstrate humane disbudding techniques
- ✔ Disbudding should occur at 6-8 weeks
- ✔ Pain relief minimises calf distress

TO HELP train farmers in humane disbudding techniques Dairy Australia has produced a series of three short videos on how to prepare, provide pain relief and disbud young calves using hot-iron cautery, which can be viewed on the Dairy Australia website.

Disbudding or removing the horn buds before the horn is fully developed is the least painful approach when done correctly.

Disbudding of calves at 6 -8 weeks of age is recommended, as smaller calves are handled more easily and have smaller horn buds, which are easier to remove and much less likely to grow back. The vast majority of Australian dairyfarmers are using this method in preference to dehorning heifers at an older age.

Disbudding of calves at six to eight weeks of age is recommended.

Adequate restraint of the head is important when carrying out hot-iron cautery to minimise discomfort or risk to the welfare of the calf and the operator.

Head restraint should be used to limit movement and allow the procedure to be undertaken effectively, but should only be applied for the minimal amount of time necessary. Sedation may also be

Factbox

TASMANIAN dairyfarmer Jane Sykes completed a research project around horn removal practices on Australian dairy farms as part of her involvement in the Developing Dairy Leaders Program last year.

The research involved interviews of 22 dairyfarmers about their dehorning practice. Miss Sykes said while a broader survey of the dairy industry needed to take place, her research delivered some key findings including:

- the Australian industry needed to ensure the availability of registered dehorning paste; and
- the majority of farmers were unaware of the Australian Dairy Farmers' outlined best practice when it came to horn removal.

Miss Sykes said a number of farmers still preferred using dehorning paste as a preferred practice and were not as comfortable using other methods.

"As far as being unaware of the latest best practice, farmers need to keep up-to-date with any practice changes that occur," she said.

Jane Sykes conducted research into calf disbudding practices in Australia.

'The new Cattle Standards will require appropriate pain relief to be used when dehorning cattle older than six months.'

used to help operators to disbud calves with less stress.

The new Australian Animal Welfare Standards and Guidelines for Cattle, currently awaiting government endorsement, clearly state that disbudding should be undertaken in preference to dehorning. Hot-iron cautery is listed as the preferred method for disbudding calves.

The use of a caustic dehorning paste is also permited for calves under 14 days-of-age that can be segregated from their mother for four hours after treatment and kept dry for 12 hours following treatment.

However, there is currently no registered dehorning paste available in Australia.

If tipping of the horns is undertaken, then only the solid horn with no blood supply should be removed, leaving a blunt horn end.

The new Cattle Standards will require appropriate pain relief to be used when dehorning cattle older than six months.

Pain relief should also be considered when disbudding younger calves as it minimises distress, makes handling easier and reduces any setback to calf growth after disbudding.

The standards do not specify how to relieve pain but currently there are options available for short and long-term pain relief (analgesia).

Short-term analgesia: The injection of a local anaesthetic such as lignocaine can desensitise the horn bud and allow disbudding to occur with minimal pain. This is often referred to as a nerve block and it is effective in young animals. Some training is required to determine the correct site to inject the local anaesthetic but once learnt and mastered it will only add a few minutes to the process.

Long-term analgesia: This is achieved by the administration of a pain relieving, anti-inflammatory medication at the time of disbudding. This reduces inflammation and relieves the pain felt after the local anaesthetic wears off.

This drug may be given by injection though recently a new product has become available that allows calves to be dosed by mouth with the analgesic.

The duration of effective pain relief provided by these drugs varies but it can range from 12 hours up to a couple of days. All drugs used for short-term and long-term analgesia in calves require a veterinary prescription.

For more advice on nerve blocks, sedation and other medication that is suitable for calves undergoing disbudding contact a veterinarian. D

The short videos can be viewed online at <http://www.dairyaustralia.com.au/Animal-management/Animal-welfare/Calves/Disbudding-calves.aspx>.

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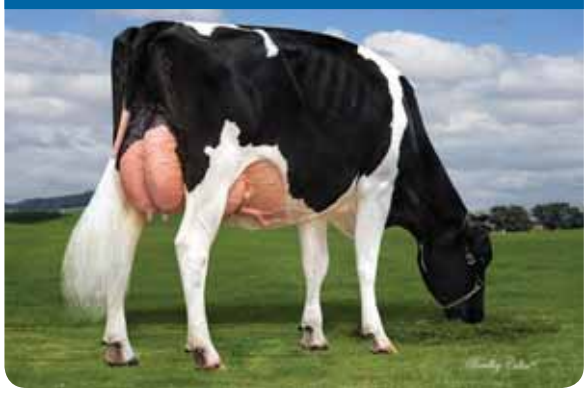

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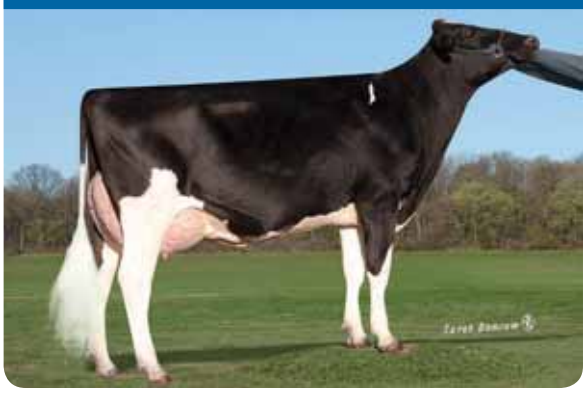

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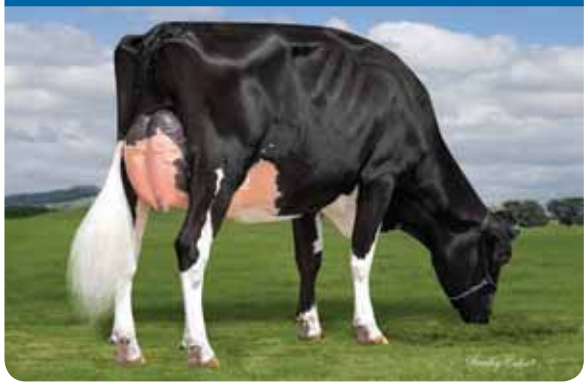
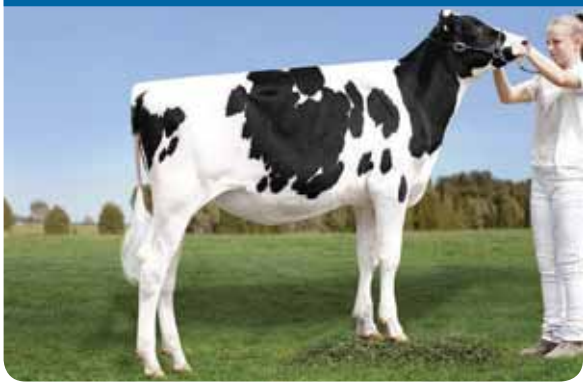
- An alternative bloodline for many Australian farmers and is recognised globally for positive health and fitness traits.

MEDALLION



- Will go down in history as one of the best bulls ever to graduate from the Genetics Australia's Horizon Progeny Test program.
- Features include below average stature, increased body capacity and strength with outstanding udder traits.
- MEDALLION is also a NO Goldwyn or Shottle alternative and a calving ease sire. He is also an A22 beta-casein sire.

ATLEY



- One of Australia's most popular genomic sires bred from one of Australia's premier cow families.
- ATLEY features high type and udder scores, outstanding workabilities and a balanced production proof.
- Breed leader for semen fertility. +3% places him in the top 5 available sires.

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