The Australian Dairyfarmer

NOVEMBER
DECEMBER
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The Australian Dairyfarmer

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Meeting increasing societal demands

IF anyone doubts the impact of consumer and wider society demands on our industry, a few stories in this edition should change their view.

Increasingly, the way we farm faces scrutiny. In part, this reflects the techno-knowledge age, with a greater understanding of the way things interconnect.

The increasingly global nature of our economies is also a factor. Multinational companies often set policies to enable them to sell products into a wide range of markets that have different standards and expectations.

It also reflects the growing power of social media and the sensitivity of governments, organisations and companies to the opinions of wider society or special interest groups.

The broadening gap between farmers and the wider community is also at play, as people increasingly have less knowledge about the details of what happens on farms. This means opinions can be shaped by those with a particular viewpoint and people are unable to assess the information presented against their own experience and knowledge.

Our cover story (see page 12), written by Marian Macdonald, looks at what is happening with genetically modified grasses. Many farmers are frustrated that grasses developed in Australia offering huge production gains still sit in trial plots, blocked by government regulation, processor bans and lack of consumer acceptance.

Her story does point out that there is hope on the horizon — with different genetic tools potentially able to be used to deliver gains.

But the comments in her story from the Friends of the Earth's emerging tech project co-ordinator point to the difficulty in getting these onto farms. The co-ordinator dismisses new techniques, saying "all gene-editing techniques can result in unexpected mutations". It's a black-and-white stance that offers little opportunity to find a middle ground.

Our story from the World Dairy Summit (see page 22) on the increasing scrutiny on antimicrobial use in agriculture offers more hope. A Dutch researcher explained how The Netherlands had cut its antimicrobial use across all species by 60 per cent within a decade but this had not led to an increase in clinical mastitis.

Antimicrobial resistance is a big issue, not just in agriculture, but for human health. But this story shows that science and industry can work together to meet the challenge without negative consequences.

Our story on a trial of a nitrogen-fixing plasma reactor in Northern Ireland (see page 63) also shows how science can help solve problems. The farm where the trial is being conducted, like many in Europe, is subject to quotas for the amount of ammonia it can produce. The plasma reactor fixes nitrogen from the air and adds it to the manure, which causes a reaction with the manure and stops ammonia losses. This produces liquid nitrogen that can be applied as fertiliser on the farm.

It's a great example of a closed-loop that offers wins for the environment and for the farmer.

We can't simply ignore the demands of wider society but with a smart approach we might be able to find solutions that are a winner for everyone. D

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The Australian Dairyfarmer

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Dairy industry gets mandatory code

Key points

- ✔ ADF to work with federal government on mandatory code
- ✔ Key requirements outlined
- ✔ Hopes code will rebuild trust and confidence

PEAK dairy farmer group Australian Dairy Farmers will work with the federal government to introduce a mandatory code of practice for the industry, on the condition that a stronger code would guarantee coverage across the entire sector and improve bargaining power for farmers.

ADF stressed that a future mandatory code must:

- Include an independent dispute resolution procedure, with small claims to be investigated.
- Outlaw retrospective milk price step downs.
- Enforce contract and price transparency.
- Be reviewed within three years, including an assessment of the code's effectiveness.

ADF president Terry Richardson said after negotiations with the group's six state-based members, a united position had been reached that a mandatory code would provide the best mechanism to ensure farmers had increased protection in their negotiations with processors.

"Farmers want to know that if they have a contract dispute with their processor, there is a mechanism in place to ensure their interests are safeguarded," Mr Richardson said.

"This was a difficult decision and one that ADF did not take lightly. There are a broad range of views within ADF's membership, and these views are deeply respected and understood."

ADF's position comes after several months of working with industry body the Australian Dairy Industry Council (ADIC), which led to the development of a strengthened code.

"We expect to play a leading role in the development of a new industry code, using the work undertaken by the ADIC as a foundation," Mr Richardson said.

Key elements of the ADIC code, which is still in draft form from guidelines set by the Australian Competition and Consumer Commission (ACCC), include:

- Retaining clauses in the current code where there is no stakeholder objection or issue.
- Adding clauses where there is universal agreement between states and processors, such as good faith provisions, standard contract timelines, protection for collective bargaining groups, independent complaint-management and dispute-resolution processes, penalties' regime and improved administrative arrangements.

Federal Agriculture Minister David Littleproud says he is committed to working with ADF to ensure a new mandatory code benefits farmers.

'This was a difficult decision and one that ADF did not take lightly.'

Mr Richardson warned there were still issues to be resolved around the implementation of a mandatory code.

"The ACCC, in recommending a mandatory code, didn't disclose the costs of administration, investigation thresholds, performance standards and accountability metrics," he said.

"We are urging the government to address these concerns through a Regulatory Impact Statement (RIS) to be disclosed to industry as soon as possible."

Federal Agriculture Minister David Littleproud said he was committed to working with ADF to ensure a new mandatory code benefited farmers.

"I agree with ADF that a mandatory code must deliver coverage across the entire industry and improve bargaining power for Australian dairy farmers," Mr Littleproud said.

Mr Littleproud said a mandatory code should improve bargaining power but was unlikely to change milk prices.

"The ACCC report stated the farmers were at a disadvantage given processors had better access to market information, and that's something we're working on through the milk price index," he said.

"We'll continue to look carefully at the issues raised in the ACCC report as we work with industry to come up with actions in response to the report.

"Now that we have philosophical agreement, we can work through the details of a proposed mandatory code together and then I can take the proposal to cabinet."

It's hoped the introduction of a mandatory code will be a vital step in rebuilding trust and confidence along the dairy industry supply chain.

The debate over the future of the industry has often been volatile. ADF is now calling for unity in dealing with the immense challenges facing the sector as it moves forward through difficult times.

"Every step along the value chain depends on strong relationships, and farmers are encouraged to collaborate and support each other to influence positive change for the dairy sector," Mr Richardson said.

Retailers must do the right thing

Key points

- ✔ $1 milk introduced on Australia Day 2011
- ✔ Short-term drought measures see increase on some lines
- ✔ Permanent end to discounted dairy products only solution

By **Terry Richardson**
ADF president

FOR nearly a decade, dairy farmers have been wearing the pain caused by discounted products, whether it's $1 per litre milk or cheap cheese.

I remember when the first $1 per litre products went on supermarket shelves on Australia Day 2011 and the outrage caused by the resultant "milk wars".

Before this marketing campaign, the last time milk was $1 per litre was around 1992. But in 2018, it's impossible to live on a wage set at 1992 levels.

Now there is momentum to turn things around and give value back to the dairy supply chain.

Some supermarket chains have announced plans to help drought-affected dairy farmers.

Woolworths introduced a special range of milk priced at $1.10 per litre in mid-October. Homebrand 2L and 3L milk products are currently on shelves for $1.10 per litre until the drought-relief milk product launches.

Coles is now selling its 3L Own Brand milk products for $3.30, with the money collected to be distributed back to farmers via a fund with an application process.

Both have been upfront about the fact that their initiatives are only short-term measures that aren't intended to solve the problem of discounted dairy products.

As president of Australian Dairy Farmers, I represent farmers all across the country. Many are calling me asking how they are eligible to receive a fair price from either of these plans.

The problem with both plans is that many regions of Australia are affected by drought with high production costs impacting thousands of dairy farmers, yet most of those farmers won't be able to claim a benefit from either initiative.

Coles has encouraged any dairy farmers to apply for a grant through their fund, but those in drought-declared areas will be given priority, while

Woolworths intends to distribute the extra 10c from their drought-relief milk back to farmers via their processor.

While I support measures that see farmers paid a reasonable price for their hard work and dedication, I must ask, "Is this really the best we can do?"

Certainly ADF and our state dairy farmer organisations believe all dairy farmers must see a benefit from any increase in retail milk prices.

Farmers put tireless effort and resources into producing a quality product. And it leaves a deep and lasting impact to see your hard work sitting on a supermarket shelf for less than the price of water.

This pricing practice is not viable and we urgently need a shared solution to assist in building the long-term sustainability of Australian dairy farmers.

Ultimately, we must push for a permanent end to discounted dairy products, whether it's $1 per litre milk or cheap cheese.

There is a groundswell of support for farmers hit hard by the drought and supermarkets have the best opportunity to scrap their discounted dairy products right across the breadth and depth of the dairy cabinet.

The supermarkets know what farmers want. They know what they deserve. It's now time for them to take a big step forward and do the right thing by ending this pricing practice.

But until that time comes, I encourage the public to help dairy farmers by continuing to buy branded dairy products.

Coles is now selling its 3L Own Brand milk products for $3.30, with the money collected to be distributed back to farmers via a fund with an application process.

'It leaves a deep and lasting impact to see your hard work sitting on a supermarket shelf for less than the price of water.'

Dairy industry's big year for trade

Key points

- ✔ TPP-II deal to provide significant benefits
- ✔ Hopes to have it ratified by end of year
- ✔ Deal with Indonesia opens up growing market

AUSTRALIA is on the brink of a landmark trade deal that will give the local dairy industry favourable export conditions and expanded access to several lucrative markets if the federal government can ratify the Comprehensive and Progressive Trans Pacific Partnership (TPP-11) before the end of the year.

The 11 member countries, including Japan (Australia's largest cheese customer) and Canada and Mexico (two countries that don't have existing trade agreements with Australia), collectively represent 32 per cent ($1.1 billion) of the total value and 35 per cent (298,000 tonnes) of the total volume of Australian dairy exports.

Australia exported more than $540 million of dairy and dairy-based products to Japan during the last financial year. The TPP-11 is expected to yield major benefits for dairy exports to the region, including:

- Phase out of tariffs, over 15 years, for cheeses including natural cheese for the production of processed cheese and cheese for shredding with the exclusion of mozzarella.
- Phase out of tariffs for fresh cheese with a fat content less than 45 per cent.
- For other varieties such as processed cheese, there are modest improvements in access.
- Major liberalisation of access for whey.
- Modest tariff rate quotas established for skim milk powder and butter.

Benefits for Australian trade with other signatories include:

- Canada — tariff rate quota access to be established for a range of dairy products, including milk, cream, skim milk powder, whole milk powder, whey powder, butter and several cheese categories.
- Malaysia — quota volumes for liquid milk access.
- Mexico — tariff rate quotas for milk, skim milk powder and whole milk powder, evaporated milk, condensed milk, butter, and various cheese lines.

The TPP-11 is expected to yield major benefits for dairy exports to the Pacific region.

> ***'If the federal government ratifies the deal, it will cap off a year of significant breakthroughs in trade for the Australian dairy industry.'***

- Peru — tariff elimination on several products, although price band system to be retained. Products include fresh milk, milk powders, yoghurt and buttermilk, whey, butterfat, and cheeses.
- Vietnam — tariff elimination on various dairy lines over periods of zero to four years, including liquid milk lines, skim milk powder, whole milk powder, condensed and evaporated milk, yoghurt, buttermilk, butter, dairy spreads, anhydrous milk fat, butter oil, ghee, and several cheese lines.

The agreement will provide welcome support to the 38,000 people working on dairy farms and in manufacturing plants who contribute $13.5 billion to the Australian economy.

If the federal government ratifies the deal, it will cap off a year of significant breakthroughs in trade for the Australian dairy industry.

The government in January signed an economic partnership agreement with Indonesia, a major destination for Australian dairy exports with a value in 2017/18 of more than $200 million and demand set to rise on the back of its increasingly affluent 260 million-strong population.

This deal will:

- Eliminate remaining tariffs on entry in force for skim milk powder and whole milk powder.
- Eliminate remaining tariffs on entry in force for grated or powdered cheese.
- Eliminate by 2026 remaining tariffs on non-liquid milk (6 per cent or less fat) and by 2033 for tariffs on liquid milk (6pc or less fat).

The Peru-Australia Free Trade Agreement (PAFTA) is also set to improve international competitiveness and export growth opportunities for the Australian dairy industry, but industry leaders have encouraged the government to make reducing non-tariff barriers a strategic priority in trade negotiations.

Fourteen aspiring leaders — farmers, business managers and export sales representatives — networked with political decision-makers and advocated for their communities as part of the Developing Dairy Leaders Program in Canberra earlier this year.

Time for young reps to step forward

Key points

- ✔ Political turmoil in Canberra provides valuable lesson
- ✔ Need industry to present united front
- ✔ Constructive input needed from farmers across country

By Terry Richardson
ADF president

I WAS in Canberra recently and witnessed first-hand the political turmoil that rocked the federal government and which ultimately led to a change of Prime Minister.

Ironically, I was accompanying a group of young dairy industry professionals as part of the Developing Dairy Leaders Program, run by Marcus Oldham College with support from Australian Dairy Farmers and Dairy Australia.

The aim of the program is to expose the next generation of dairy representatives to industry advocacy and the Australian political process.

What they received was a valuable bonus lesson: leadership is everything.

Many of these young farmers had never visited the "bush capital" and had little understanding of how Canberra operates. For them, it was eye-opening to be caught up in the feverish atmosphere that engulfed the city during those four days.

But the leadership lesson is transferable to the dairy industry, which we all know has struggled with its own leadership issues in recent years.

We talk a lot about unity. We talk about creating the mindset of ***one team, one dream***. But at some point, these words lose their value if we fail to act.

The young dairy professionals I accompanied were in fierce agreement that unity is the vital element to ensuring a successful dairy industry.

This sentiment was reinforced by Agriculture Minister David Littleproud, who told the group that if they want to be taken seriously and influence federal politicians to achieve real outcomes for the dairy industry, the sector first needs to show leadership.

I have written before about the fractured state of the dairy industry. Our differences have become pronounced. Too often, we think only about the interests of our individual regions, instead of common ground that could provide a national, tangible benefit for dairy farmers.

This makes it difficult for political decision-makers in Canberra to understand which policies are likely to have the greatest benefit for farmers. Politicians love an industry that brings to them solutions instead of problems. But instead, we have an industry too concerned with its internal issues to agree on solutions to the many problems we face.

As we saw in Canberra, this situation can have many consequences but won't lead to outcomes.

The question is usually posed on social media: "*why can't dairy advocacy groups work together on behalf of farmers?*" The simple answer is there's no reason why we can't.

ADF, as the national peak organisation for dairy farmers, is the group responsible for taking solutions to Canberra and asking the federal government for its support in enacting these measures. To be effective, we need constructive input from farmers across the country who want to ensure a secure and prosperous future for the dairy industry.

Hopefully, this means you. We need you to join your state dairy farmer organisation and join the cause. Contribute your ideas and help us maintain a sustainable dairy industry. D

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Dairy Australia Round Up

Dairy Australia
Your Levy at Work

Industry plan to deliver new strategy

By **David Nation**
Managing director
Dairy Australia

Key points

- ✔ Challenging season, with a drier and warmer spring and summer
- ✔ Dairy Australia actively working to ease cost pressures
- ✔ Industry plan to be delivered next year, providing strategic direction

NOVEMBER and December seem to be the months where the calendar speeds up and before we know it the year has ended. For those farmers that have had good soil moisture, I hope that the silage and hay season has been a good one and you can finish the year in good shape. However, we recognise that this is a challenging season and the lack of usual rain is now affecting more than 40 per cent of the industry.

It is now well established that most dairying regions will experience a warmer and drier end to spring and start of summer, and the ongoing cost pressures of high grain, hay and water prices will continue. This means that your farm plans need to keep evolving, and in response, we are doing the same at Dairy Australia.

One area that has been a priority for us is to better understand the drivers of grain prices with a focus on the outlook for winter grain harvests that could provide price relief, opportunities for more cost-effective transport of grain across the country from west to east, and opportunities for feed imports that relieve cost pressure. There appear to be opportunities in each of these three areas, and we are active in working on behalf of industry to invest and strive for price relief.

A second area that is a focus is to contribute to a whole-of-industry plan that identifies and prioritises the most important activities for the future prosperity of the industry. The plan will take shape in the first half of next year, and will drive the next strategic plan at Dairy Australia. I'll have a lot more to say about this in future editions of the *Australian Dairyfarmer*.

The combination of support during this difficult year, as well as an ability to raise awareness of how investments and innovations will provide opportunities in future years, is at the core of how we can serve and deliver ongoing value to your businesses.

I'd like to make particular mention of the importance of Dairy Australia working with the Gardiner Foundation. Together we are investing in the Feed Shortage activities, and are also investing in both the DairyBio and DairyFeedbase innovation programs. Our combined ability to invest means that we can substantially increase support and lift our level of investment in innovation programs.

Feed Shortage activities have ramped up at all eight regional development programs.

Please make contact, and take advantage of the range of services that are there to support you through this challenging year.

As we reach the end of the year, I hope that there will be time for festivities and to turn the corner into 2019 with a positive outlook on how the industry can continue to change for the better. D

New farm profit and capability manager appointed

DAIRY Australia has appointed Peter Johnson as its new group manager, farm profit and capability, the role that leads the industry body's research, development and extension activities.

Mr Johnson was previously Dairy Australia's feedbase and nutrition manager, with a career that has also included working in extension for NSW Agriculture, as a rural manager with Rabobank, and as a national sales and marketing manager in the seed industry.

The role is responsible for ensuring Dairy Australia's strategic initiatives are delivered in the right way to farmers to drive real improvements in farm profitability and capability in the dairy industry's workforce.

"I'm very passionate about the opportunity to help dairy farmers with their challenges and opportunities," Mr Johnson said.

"Our challenge is to help keep all farmers up to date with new practices and technologies as they appear, being delivered by people with the right skills in our core role to help boost farm profitability and capability which is the name of our group."

Mr Johnson said he would be reviewing Dairy Australia's farm and capability programs to reflect current trends in agriculture and ensure adoption on-farm.

"We've got to have the strength to realise that there are different ways of doing things and respond to what's happening in the agricultural world," he said.

A strong focus would remain on DairyBio, a five-year $60 million partnership with Agriculture Victoria to create improved pastures and improved herds for the Australian dairy industry through the latest approaches in bioscience.

A further focus is the $54 million DairyFeedbase program, a joint venture with government and the Gardiner Foundation aimed at increasing farm profitability by improving pasture production, utilisation and herd nutrition. Further key programs include the C4 Milk project to assist northern dairy farmers to develop and implement efficient feeding systems that increase margin over feed costs on farm.

Dairy Australia's partnership with the Tasmanian Institute of Agriculture to deliver targeted dairy productivity research and extension services in Tasmania to help drive dairy farm profitability and sustainability was another significant investment, Mr Johnson said.

"Despite the challenging seasonal conditions the long-term trends for dairy are positive and our latest Dairy Farm Monitor Project data shows just how profitable dairy farming can be for some operators," he said.

"We have an amazing team at Dairy Australia with very strong connections across the industry and I'm excited by the challenge ahead."

Mr Johnson holds a Bachelor of Science in Agriculture from the University of Sydney and a Masters of Business Administration from Charles Sturt University.

GM rule change potential gamechanger

Key points

- ✔ New genetic technology awaiting parliamentary approval
- ✔ GM grass offers significant gain to dairy farmers
- ✔ Consumer and customer acceptance key
- ✔ Genomic selection offers GM-free gains

By **Marian Macdonald**

A NEW definition of "genetically modified" currently awaiting parliamentary approval could see a swathe of new grasses on the market within three years.

According to Dairy Australia, GM grass offers gains in the order of $800 per hectare per year for farmers. It is no empty promise: the grasses capable of delivering massive increases both in yield and in quality are 10 years old and growing in south-west Victorian paddocks. The roadblocks are regulatory hurdles, dairy processor bans and market acceptance.

For now, those decade-old "classic" GM grasses remain in trial plots tended and measured by DairyBio scientists in the belief circumstances will change.

But not all modification of genetics is necessarily "genetic modification".

Dairy Australia's new managing director Dr David Nation is fresh from the role of DairyBio co-director and said the research body deliberately pursued a type of genomic technology looked upon more favourably by regulators.

Scientists using classic GM technology "cut and paste" or "copy and paste" genes from one plant into another. The zinc-finger genome-editing techniques DairyBio uses, on the other hand, simply "cuts" without introducing anything new to the plant.

"It creates what I call a 'messy cut'," Dr Nation said. "So, when the plant cell naturally repairs the DNA strand, it loses a small number of bases, which are the individual building blocks of DNA.

"That cut-and-repair process changes the function of that gene and gives the opportunity to produce plants with the trait of interest.

"I'm being very specific in describing that process because the government regulator has put a proposal to government to call that method 'not an act of genetic modification'."

Parliamentary approval of this Office of the Gene Technology Regulator (OGTR) proposal would remove the regulatory hurdle. Still, the problem of market acceptance remains.

A 2017 survey of Australian consumer attitudes commissioned by OGTR shows support for GM technology is slowly growing, although is more readily accepted for medical than agricultural use (see Figure 1).

The surveyed consumers showed little understanding of gene editing. Only 17 per cent said they knew enough about gene editing to explain it to a friend. Even so, more than half (57pc) believed it would "improve our way of life in the future".

Researcher Dr Pieter Badenhorst at the Hamilton research centre in south-west Victoria.

The community's gradual warming has not silenced the vocal resistance to GM grasses. Asked about the relative risks of zinc finger genomic editing, Friends of the Earth's emerging tech project co-ordinator Louise Sales pointed to international opposition.

"The European Court of Justice recently ruled that gene-editing techniques such as zinc finger nucleases pose the same risks as older genetic modification techniques and need to be assessed in the same way," Ms Sales said.

"Recent studies have shown that all gene-editing techniques can result in unexpected mutations, which could result in the production of novel toxins or allergens.

"Besides the potential risks to livestock, the environment and human health, there are also important economic risks to consider.

'There are mixed views towards genetic modification along the dairy supply chain because its benefits and impacts depend on where you sit in the supply chain.'

"Key export markets such as Europe regard these techniques as GM and have zero tolerance for the presence of unapproved GMOs.

"The inability to contain GM ryegrasses will jeopardise the ability of farmers to produce a GM-free product."

Fearing damage to international markets, Australian dairy processors require farmer suppliers to keep records declaring their stockfeed GM-free.

In contrast, Australian Dairy Farmers' policy "recognises the potential productivity benefits of GMOs" and "supports farmers' rights to use GM technology where available, and supports farmer choice between the use of GM and conventional technologies".

The ADF also referred to legal and regulatory positions to justify its policy.

"OGTR and Australia's other GMO regulators (Food Standards Australia New Zealand for GM food, the Australian Pesticides and Veterinary Medicines Authority for agvet chemicals containing GM material and the Therapeutic Goods Administration, the National Industrial Chemicals Notification and Assessment Scheme and the Department of Agriculture and Water Resources for other GM products) have been monitoring these and other GMO initiatives across the world," an ADF spokesperson said in a written statement.

"In each of the cases for commercial growing of GMOs, the OGTR found the weight of evidence demonstrates GMOs are as safe as their conventional counterparts.

"FSANZ also found that gene technology has not been shown to introduce any new or altered hazards into the food supply.

"These positions are consistent with statements from the World Health Organisation and US Drug Administration."

Former Dairy Australia manager of biotechnology and strategic initiatives, then CEO of Agrifood Awareness Australia, and now consultant, Paula Fitzgerald, urged the industry to begin discussions internally. ▶

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"There are mixed views towards genetic modification along the dairy supply chain because its benefits and impacts depend on where you sit in the supply chain," Ms Fitzgerald said.

"Those closest to the customer are more aware of consumer concerns. The question is: will the industry be able to have a conversation about GM. If you're a farmer supplying a product, you'd like to think about this as a partnership, particularly given significant farmer levies fund the research.

"It can be done. Today, over 90pc of cotton grown in Australia are GM varieties.

"The grain industry has also grown GM canola since 2008, and more than 30 entities representing the entire supply chain came together years ago to address the challenges.

"They co-operated and they were willing to have the tough conversations. It's essential that the dairy industry has a united approach before any consumer outreach begins."

Dr Nation said the conversation was already underway. Dairy Australia was among the contributors to a report by a trans-Tasman independent expert panel on GM. While that report is not publicly available, Dr Nation said it confirmed DairyBio's target of $800 per hectare per year was realistic and mapped the benefits right along the supply chain.

A pragmatic approach to the GM debate is being taken by a partner in DairyBio's pasture research program, the Royal Barenbrug Group, which is also the parent of local seed company, Heritage Seeds.

Its science and breeding manager, Allen Newman, is quick to distance Barenbrug from GMO grass but stresses the importance of genetic technologies.

"Barenbrug supports using genetic technologies to breed better grass but not to create GMO grass," he said.

"We believe that if we don't help to provide direction to scientists, we're not going to be able to keep up with demands on us.

"We need to be able to lean on technology to develop products in an increasingly challenging climate."

One of those genetic technologies enables a modern twist on an age-old form of breeding: hybridisation.

"Beginning with perennial ryegrass, DairyBio is developing F1 hybrids to increase vigour," Mr Newman said.

"While most corn grown today is an F1 hybrid, it's only been in the last five or six years that scientists have been able to identify the genes that prevent the self-incompatibility needed to create the highly inbred parents needed for an F1 cross."

Traditional selective breeding has also been advanced with genetic technology.

"Genomic selection means understanding genes and phenotypes to predict which grasses will perform best," Mr Newman said.

"Phenotypes are the characteristics of grasses that are a result of genetics and the environment, such as yield, persistence, disease resistance, seasonal growth patterns, quality and the interaction between the plant and endophytes.

"Genomic selection is not genetic modification — all the plants are bred conventionally — but being able to pick the best performers early allows for three times the progress gain.

"In other words, we can make 21 years of genetic gain in seven years. When you consider that 0.5 to 0.7 per cent genetic gain is made each year, the timeframe is very important."

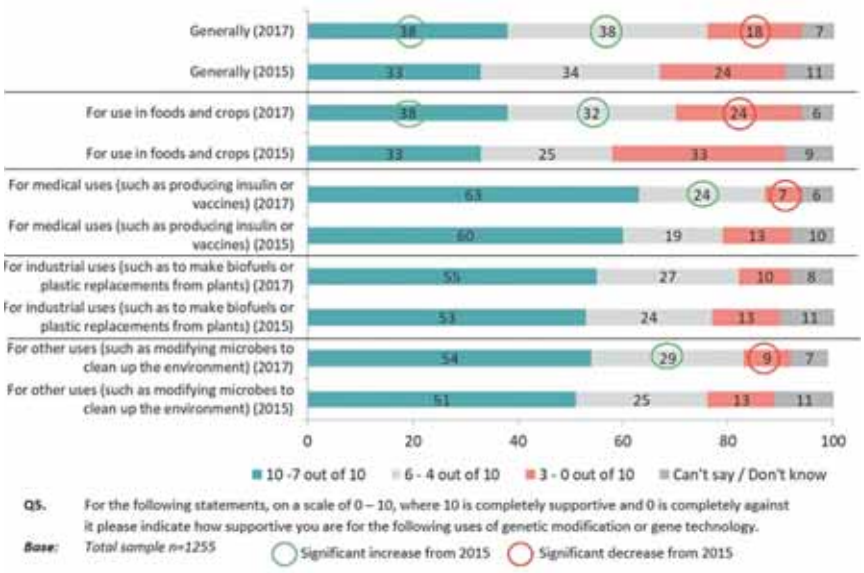

Figure 1. Levels of support for GMOs and gene technology
Source: Office of the Gene Technology Regulator (OGTR)

Vegan diets don't cut carbon footprint

Key points

- ✔ Dutch research into sustainable diets and environmental impact
- ✔ Shows little net benefit in cutting out animal products
- ✔ Cutting overseas travel more beneficial

REDUCING animal-based products in favour of plant-based products did not impact the environment any less as the carbon footprint was not greatly reduced, Dr Stephan Peters, of the Dutch Dairy Association, NZO, told the World Dairy Summit.

Dr Peters addressed the issue of sustainable diets and their environmental impacts at the International Dairy Federation summit in Daejeon, South Korea, on October 17.

Dr Peters outlined studies in The Netherlands on life-cycle assessments (LCAs) used to calculate the environmental impact of each product from production to consumption. The studies have revealed that every household (averaging 2.18 persons in The Netherlands) produces 23 tonnes of carbon emissions annually.

About a quarter of the amount — 5.6 tonnes of carbon emissions — are from food production. They comprise carbon dioxide emissions from the following foods: meat and fish (1.8 tonnes), dairy and eggs (1.1 tonnes), vegetables and fruits (0.5 tonnes) and all other products (2.2 tonnes).

"Theoretically, carbon emissions from the human diet could be reduced by 2.9 tonnes annually by becoming a vegan," Dr Peters said. "But the calories and nutrients lost by avoiding animal products have to be compensated by consuming a larger quantity of plant-based products, which have a carbon footprint as well. And they all add up."

Dr Stephan Peters: To meet essential nutrients, a vegan diet requires a person to consume more than the recommended daily amount of fruits and vegetables, increasing their carbon footprint.

Dr Peters said that transitioning towards a more sustainable diet involved eating more locally produced foods, less processed foods (particularly those made from many different ingredients) and reducing food waste.

> ***'A flight to a distant part of the world for work or vacation can undo an entire year's worth of environmental benefits from a vegan diet of locally grown food.'***

A consumer trying to eat less animal-based products and more plant-based products must ensure that their new diet still lowered their carbon footprint.

Achieving this goal was not easy, said Dr Peters, who is also the chair of IDF's standing committee on nutrition and health.

"Alternative foods must still provide the essential nutrients our bodies need," Dr Peters said. "By omitting nutrient-rich dairy, for example, nutrient replacement has to come from other food products.

"The individual will have to consume more than the recommended daily amount of fruits and vegetables to attain optimum calcium intake, as the latter has relatively less nutrients compared to dairy. When you examine the environmental effects of the considerable amounts of food substitutes needed to be consumed, this results in almost the same amount of carbon emissions as dairy."

Dr Peters said that moving to a largely plant-based diet did not necessarily result in a more environmentally friendly diet. He said an optimal diet produced 3.67kg of carbon emissions daily while a dairy-free diet produces 3.53kg of carbon emissions, which is a negligible amount.

Therefore, he concluded that maintaining dairy consumption at the current level would not impact greatly on a sustainable diet.

Lifestyles had a much greater environmental impact, especially if it involved eating a lot of imported fruits and vegetables, and travelling.

"A flight to a distant part of the world for work or vacation can undo an entire year's worth of environmental benefits from a vegan diet of locally grown food," Dr Peters said. D

See more reports from the World Dairy Summit, pages 22-26.

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Making every cow count

Key points

- ✔ Herd testing allowed identification of higher producing cows
- ✔ Helped manage somatic cell count level
- ✔ Costs about $15/cow/year

WHEN Queensland dairy farmers Geoffrey and Ruth Chalk took over management of the family farm, they had a priority list. On top of the list was to get their line of Holsteins back into herd testing so they could fine-tune their operation.

In the past financial year, the couple milked an average of 132 cows and produced 944,919 litres, testing at 3.97 per cent fat and 3.27pc protein.

That performance, Geoffrey said, was 33pc higher than when they first started herd testing and while not all of this gain can be attributed to monitoring, some certainly could be attributed to it. This was enough to vindicate their decision to re-introduce herd testing to their farm enterprise.

The Chalks took over the Carneys Creek, Queensland, property from Geoffrey's parents John and Carol Chalk officially a year ago but have been taking an active management role since 2013.

The herd calves year-round, with a peak in autumn, and is run as a partial mixed ration system in 1000-millimetre rainfall country close to Boonah, Queensland. Due to the climate variability, there has been a switch to include more conserved fodder in the ration to get through dry periods when pastures are poor.

Geoffrey and Ruth began herd testing under the ImProving Herds project in March 2015, choosing a time when they knew most of their cows would be freshly in milk. While the herd had been herd tested in the past, Geoffrey said it was less detailed than the current method.

When Geoffrey and Ruth Chalk restarted herd testing, they discovered cows that weren't even covering their costs of production.

"I was only a teenager when my parents were herd testing, so I didn't really take much notice," he said.

"But I also had some experience when I worked as a relief milker on another farm. They seemed to always schedule herd testing for my shift, so I saw what was being done."

Ruth and Geoffrey had been talking about herd testing, but ImProving Herds gave them an incentive to get started.

The first challenge was finding meters. They run one of only two dairy farms remaining in their district, and in the past, there were meters that had been bought and shared between a bigger group of farmers.

'We are farming smarter, not harder and knowing objective information is key.'

Fortunately, this equipment is still available and was able to be borrowed for their testing sessions every six to eight weeks.

But Geoffrey said this could be an issue for other farmers considering herd testing, as the access to meters and the outlay might be a deterrent for those looking to start herd testing. However, he thinks that it is a crucial practice especially when feed costs are high and dairy margins are very tight.

The initial herd test was a challenge to complete but not impossible. Cows had ear tags but were not used to them being read, so the herd testing took extra time to complete.

"It was a bit of a shock to both us and the cows," Geoffrey said. "As the cows walked in, we read the numbers off their ear tags and clearly there are better ways of doing this than the manual reading."

Herd testing adds about half an hour to the milking time, but Geoffrey said this was by no means a deterrent to doing it.

The initial herd testing saw, in Geoffrey's words, "a big change around in our herd".

"We had some cows that were not even covering their costs of production," he said.

"It's hard to tell by just looking at a cow, clearly, but if you don't measure, you can't monitor. We were really surprised by the results of some of the cows and the herd testing is a great way to break down the herd into those that are performing and those that aren't.

"When you think about what you pay for feed, cows need to be performing."

The Chalks feed about six kilograms of grain a day, four kilograms in the bail over two milkings and another two kilograms in a feed mix fed on a feedpad. They also use corn silage that is grown on contract on a nearby farm, and in four out of five years, grow their own hay.

And while their system is mainly pasture-based with a mix of ryegrass and kikuyu, those supplements do not come without a cost, so cows need to be performing to not only cover those costs but make a profit for the business.

End results

When the first herd testing results came in, the Chalks were able to look at their herd to pick out those cows that were under-performing.

But Geoffrey said it was important to look at a full lactation of herd test results or at least a number of tests before making culling decisions.

"This is all about putting together a history of the cow's performance rather than judging her on just one test result," he said.

"We will look at herd test results from a 12-month period or a lactation and then make decisions."

They have also used the herd testing information to monitor cows for individual cell counts.

Prior to herd testing, cows were monitored for mastitis by physical signs.

"We knew there were a few problem cows and we could cull those but being able to monitor is a lot more objective," Geoffrey said.

"Cell counts are a big thing for us. When the herd testing comes in, we know which cows are bumping this up.

"When we supply our milk company, Dairy Farmers Milk Co-operative, we have to have a bulk cell count of less than 200,000 to get the maximum quality bonus. That incentive is nearly your profit, so we need to make sure that we are gaining this bonus.

"We will definitely cull cows based on herd test results if they have a high somatic cell count, but we also cull if they are barren."

The Chalk herd is producing 33 per cent more now than it did when the farm started herd testing three years ago.

Table 1: Geoffrey and Ruth Chalk, Carneys Creek, Southern Queensland farm stats (August 2018)

Herd size:	135
Breed:	Holstein
Farm size:	238ha
Dairy:	12-a-side swing-over herringbone
Staff:	One full-time with two part-time (owner operated)
Feeding system:	Partial Mixed Ration
Herd testing history	Lapsed but had done in the past

Cost benefits

The Chalks have now settled into a pattern of herd testing every six to eight weeks. It comes at an annual cost of about $2000, or less than $15 a cow.

It has allowed Geoffrey and Ruth to make good business decisions about their herd. "We are farming smarter not harder and knowing objective information is key to that," Geoffrey said. "When margins are tight, you need to monitor each input in your business and each output."

With three years history of herd testing under their belt, there are cows in the herds that have in-depth records.

"We have got some-long term information and know the life history of some of our herd. At a cost of $2000, it's pretty much a no-brainer," Geoffrey said. D

For more information, contact DataGene, phone (03) 9032 7191 or email <abv@datagene.com.au>.

ImProving Herds was a Gardiner Dairy Foundation project in collaboration with Dairy Australia, DataGene, the Victorian Government, Holstein Australia and the National Herd Improvement Association of Australia (NHIA).

Herd testing adds about half an hour to the milking time, but Geoffrey and Ruth Chalk say this is not a deterrent to doing it.

Dairy Australia
Your Levy at Work

Farm safety a priority this holiday season

Key points

- ✔ Farm safety focus as school holidays approach
- ✔ Use Farm Safety Starter Kit to identify risks
- ✔ Set clear rules

A SPOTLIGHT is being put on safety as the summer school holidays approach and children and visitors begin spending more time on the nation's dairy farms.

With challenging conditions adding to pressures on farm, Dairy Australia's Sarah Thompson said the safety of farm families was too important to let hazards go unaddressed.

"In the blink of an eye, an accident can happen on farm and your child, grandchild or a visitor could be seriously injured," Ms Thompson said.

As many farmers are working longer hours, possibly with fewer staff, Dairy Australia is highlighting its farm safety resources ahead of the summer school break.

Dairy farmers can use Dairy Australia's Farm Safety Starter Kit to conduct quick safety scans of their properties before school wraps up for the year.

The Farm Safety Manual and workshops conducted in dairy regions also guide farmers through the development of a comprehensive safety system on farm.

"Nothing is more important than ensuring our loved ones, staff and visitors are safe," Ms Thompson said.

"Every accident involving a child on farm is preventable, and there is no better time to consider safety on farm than as the school holidays approach."

For Gippsland dairy farmer Trish Hammond, school holidays are an opportunity to remind her young children about the importance of safety on her 650-cow farm in Labourtouche, Vic.

"When we are out on the farm, the kids are with us as well — and during school holidays, this means we take the time to keep them safe," Mrs Hammond said.

"At the dairy, kids are always exposed to safety hazards but we have a number of rules in place to make sure they stay safe."

Mrs Hammond and her husband Mark have been dairy farming for eight years. During school holidays, their three kids — Dane, 10, Amber, 8 and Lara, 6 — will be spending more time on farm.

Mark Hammond with daughter Amber on their Gippsland farm.

Mindful of potential safety risks, Mrs Hammond's children are not allowed in the dairy without a parent present, and children and visitors are supervised at all times.

"We're very close to a road and my fear has always been that the kids will venture off, so we put in place an 'invisible line' the kids are not allowed to cross — they know the places on farm that are out of bounds," she said.

Before heading out in the paddock with their parents, Dane, Amber and Lara are reminded to be careful around the herd and never go near the effluent ponds.

"Sometimes, kids do come out into the paddocks with us but we spend a fair bit of time with them talking about how cows can be volatile and teaching them about animal behaviour," Mrs Hammond said.

"The kids always know never to get close to a cow and they are always watching the distance between them and the animal.

"Effluent ponds are also off limits — they are no-go zones and the kids have grown up knowing the ponds are absolutely out of bounds."

At a recent Women in Dairy event hosted by GippsDairy, Mrs Hammond received high visibility Legendairy vests for her kids to wear on farm to boost their visibility and encourage greater safety awareness.

With milk tankers and other vehicles often coming and going from the Hammond farm at odd hours, Mrs Hammond knows Dane, Amber and Lara will be clearly visible to drivers.

"The kids are always highlighted with these vests and the tanker driver knows to watch out for them too," she said.

"You don't always know when a truck will turn up but with the kids wearing high-vis vests, a truck can always spot them and they are always in our sight." D

Farmers can access Dairy Australia's farm safety tools at <thepeopleindairy.com.au> or register for workshops by contacting their local Regional Development Program.

Reducing the use of antimicrobials

Key points

- ✔ Dutch reduce dry cow treatment and antibiotic use for mastitis
- ✔ No increase in clinical mastitis
- ✔ Also led to reduction in antimicrobial resistance

HEALTHY dairy farming is possible with less use of antimicrobials, the International Dairy Federation World Dairy Summit heard.

Dr Tine van Werwen, of the University of Utrecht in The Netherlands, told the summit in Daejeon, South Korea, on October 18, The Netherlands had cut its antimicrobial use across all species by 60 per cent within a decade. This had led to an associated reduction in antimicrobial resistance in animal bacteria.

"The proactive action of the Dutch dairy industry in reducing antimicrobial usage saw a reduction of dry cow treatment by 49pc and reduction of mastitis tubes by 40pc, with no increase in clinical mastitis," Dr van Werwen said.

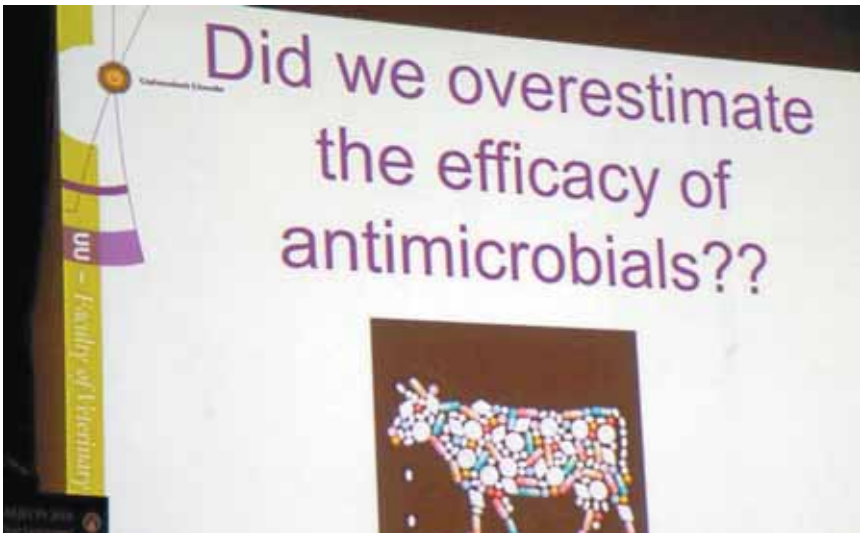
She said farmers and vets needed to be convinced on the need to reduce the use of antimicrobials and consider the impact of antimicrobial resistance. Dr van Werwen said a task force on antimicrobial resistance set up and supported by the Dutch government in 2008 had been instrumental in the overall reduction in antimicrobial use in the country through prudent usage.

"The government imposed mandatory reduction by 20pc in 2011, 50pc in 2013 and 70pc in 2015," she said. "More than 67pc of total usage is used intra-mammary, and therefore the focus is on udder health."

The success of the initiative was also due to the co-operation of the Dutch dairy industry in changing the attitudes of farmers and veterinarians towards antimicrobial use in animals.

"Without being forced by legislation, we would never have accomplished these results," she said.

Dr Elisabeth Erlacher-Vindel of the World Organisation for Animal Health (OIE), outlined the organisation's strategy on antimicrobial resistance and the prudent use of antimicrobials in animals. This includes monitoring the use of antimicrobials in animals and encouraging the implementation of international standards and guidelines.



Farmers and vets needed to be convinced on the need to reduce the use of antimicrobials and consider the impact of antimicrobial resistance.

"Antimicrobial resistance is a threat to animal health and welfare, food supply and food safety worldwide," Dr Erlacher-Vindel said. "To ensure sustainability of livestock production, the efficacy of antimicrobial agents must be preserved through their responsible and prudent use."

She stressed the need to build and maintain a database to collect information on the use of antimicrobial agents in food-producing and companion animals, with associated analysis and annual reporting. Dr Erlacher-Vindel said efforts must be made to guide and support research into alternatives to antibiotics to encourage the development and uptake of new tools, products and methodologies.

In addition, she said governments needed support to develop and modernise legislation governing the manufacture, marketing authorisation, importation and distribution, and use of veterinary products.

Professor Henk Hogeveen, of Wageningen University of The Netherlands, told the summit better animal health often gave better profitability. He pointed out that farmers often underestimated the cost of diseases and the fact that preventive costs were much lower than failure costs.

"There are opportunities to increase animal health and profitability through economics and optimal decision-making, which weighs the benefits of less disease against the costs of prevention," Professor Hogeveen said. "The optimal decision-making is not per definition profit maximisation.

"There is difficulty in cost estimations of cattle diseases, thus cost-benefit analysis is important in determining cost-effectivity."

Dr Tine van Werven and Dr Elisabeth Erlacher-Vindel in a panel discussion on antimicrobial resistance at the World Dairy Summit.

Professor Henk Hogeveen: better animal health often gives better profitability

Short-term prices don't reflect dynamics

Key points

- ✔ Short-term global food prices don't necessarily reflect long-term trends
- ✔ Global market for dairy steadily increasing
- ✔ Market opportunities in Asia-Pacific

Benoit Rouyer: Natural and ethical claims on new food and drink product launches are on the rise.

SHORT-TERM prices on world food markets did not necessarily reflect the long-term market dynamics, an economist told the World Dairy Summit in Daejon, South Korea, on October 16.

Benoit Rouyer, an economist at Centre National Interprofessionnel de l'Economie LaitiŠre (the French national inter-professional centre for the dairy industry), told the summit short-term market developments were disconnected from the long-term socio-environmental challenges, such as feeding the world.

Mr Rouyer cited the example of China, which after years of steady growth, decreased milk imports in 2015 — something that was unpredictable and impacted global dairy prices.

Likewise in 2014, Russia placed a ban on food imports, which was also difficult to anticipate.

Nevertheless, he said there were positive trends in global markets.

The global market for dairy products had been steadily increasing from about 270 billion euros in 2007 to 427 billion euros in 2017.

Market opportunities lay largely ▶

in the Asia Pacific region, fuelled by population growth and increased purchasing power of the middle class. He said other market prospects were in Latin America, Africa and the Middle East.

Mr Rouyer also discussed new marketing trends in the food and beverage sector.

"Natural and ethical claims on new food and drink product launches are on the rise with claims of organic or natural products, with no additives and preservatives, and which are also GMO-free," he said. "Manufacturers are also paying greater attention to ethical and environmental issues, such as environmentally friendly packaging, as well as animal and human welfare."

Mr Rouyer said business growth was propelled by global expansion to capitalise on market opportunities and product segmentation in different countries. "Internationalisation is a key development factor for dairy leaders," said Mr Rouyer, citing the case of Nestle's worldwide investment strategy in the past few years in all corners of the world, with dairy plants in 53 countries, while Lactalis has dairy plants in 47 countries.

Not to be outdone are dairy groups in emerging markets that are expanding their industrial bases abroad.

"Improved living standards in emerging countries have fostered both the internationalisation of Western dairy groups and the appearance of local dairy leaders in emerging economies," Mr Rouyer said.

Mexico's Lala bought Brazilian group Vigor last year, adding nine dairy plants to its industrial assets to expand its reach beyond the United States, Costa Rica, Guatemala and Nicaragua.

In South East Asia, Mr Rouyer said Vietnam's Vinamilk acquired a 51 per cent stake in the Lao-Jagro Development Xiengkhouang Co in July this year to get a foothold into the Lao market through the establishment of an organic dairy farm in a Japanese joint-venture. This move would increase Vinamilk's footprint in the Mekong region, following its earlier inroad into Cambodia in 2016 with a 51pc stake in Angkor Dairy Products Co. which was fully acquired last year by Vinamilk.

Mr Rouyer said there had been rise in investments in cheese production in the US, Russia and Ireland in the past year to meet increasing demands from Asia.

New Zealand and Ireland had announced local multi-million-dollar investments in dry dairy ingredient factories to catch the wave in global demand driven by a surge in consumption. D

Milk critical food source: Ban Ki Moon

MILK and dairy products will serve as a critical, sustainable food source for the world's 9 billion people by 2050, according to former UN Secretary-General Ban Ki Moon.

In a keynote speech delivered at the opening of the International Dairy Federation's World Dairy Summit 2018 in Daejeon, Korea, on October 15, Mr Ban said the increase in world population would be be followed by acute food shortage.

"I believe that milk will be one of the solutions to combat any food shortages that may occur," he said.

"Milk is a primary food staple for the world's population of more than 7 billion people. Scores of malnourished and food-insecure children across the world receive crucial nutrients from milk."

Mr Ban said milk was critical and essential for international efforts to combat poverty and hunger, stressing the importance of milk in providing essential nutrients for starved children. "Milk serves as an important nutritional food, as well as an essential staple for emergency relief," he said. "Providing milk is one of the simplest ways to help people in conflict areas and disasters."

Mr Ban said he was heartened to note that the dairy industry was committed to sustainably providing nutritious dairy products, while also making efforts to preserve the environment. He cited the Dairy Declaration of Rotterdam, a joint initiative of the IDF and the UN Food and Agriculture Organisation launched in October 2016 to promote dairy sustainability through responsible consumption and production.

The dairy sector played a leading role in international efforts to achieve the Sustainable Development Goals (SDGs), which are aimed at socio-economic transformation to eradicate poverty and hunger, and to construct a sustainable world where humanity could enjoy better education, healthcare, and equality.

The SDGs were launched in 2015 during Mr Ban's tenure at the UN, and sustainability remains a key passion of his. He serves as co-chair of the Ban Ki-Moon Centre for Global Citizens in Vienna established in January 2018 within the framework of the Sustainable Development Goals to empower women and youth.

Mr Ban said the dairy sector played an important role in helping to achieve many of the SDGs covering poverty eradication, banishment of hunger, good health and wellbeing and gender equality. The dairy sector created employment through its value chain, generating the third-largest output and the largest trade volume among all agricultural industries.

At the same time, he acknowledged that the dairy sector was promoting environmental protection by implementing initiatives to reduce global carbon and water footprints by striving to minimise greenhouse gas emissions, and water and soil pollution generated during the production and distribution of dairy products.

"Unlike produce that is harvested once or twice a year, dairy products can be produced every day," he said. "This means that more cash can circulate through rural areas, injecting vitality into rural economies. As a result, the well-being of rural areas is improved, and the quality of living is enhanced."

Mr Ban urged the dairy community to collectively prepare for the next century by strengthening sustainability for the next generation.

"Seven billion people around world today not only recognise milk as a healthy food, but also appreciate the value of the dairy industry for its contribution to humanity's growth."

He called on the dairy sector to continue to strive through collective efforts to achieve the SDGs.

"I hope the accomplishment of these goals can help construct a better environment for your industry to further prosper. I hope you can forge a robust global partnership that goes beyond the boundaries between countries, continents, and regions, and that you can work together to drive the development of humanity and society as global citizens.

"I look forward to your industry being duly recognised not only for the nutritional values of its products, but also for its industrial values rooted in sustainability and responsibility. I truly believe this will further enable your industry to actively contribute to humanity's happiness."

Cheese key to export growth

Key points

- ✔ Asia forecast to increase cheese imports
- ✔ Australia opportunity for high-quality
- ✔ US, Europe and NZ also competing for market share

By **Carlene Dowie**

Asia is a key region for growth in cheese consumption.

CHEESE exports hold the key to growth in major dairy production regions around the world. A slew of reports in recent months has highlighted the opportunities for developed countries to increase cheese production, with developing countries in the Middle East and Asia forecast to grow cheese imports.

The latest report was released by the International Dairy Federation at the World Dairy Summit in Daejeon, South Korea, on October 16.

The *IDF World Dairy Situation 2018* report said key export regions, such as Oceania, the United States and the European Union, would see cheese production grow in years to come as they had to keep up with accelerating import demand in Asia, with Japan, the Republic of Korea and China being important destinations.

The report, which was put together by IDF experts from dairy-producing countries around the world, also revealed that there had been above-average global milk production growth in 2017 on the back of better prices. The strongest growth was recorded in India, Pakistan, Turkey, Australia, Poland and the United Kingdom.

It also found there was greater import demand by China last year due to a shortfall in milk production. The ▶

East Asian country regained much of its strength as the number one dairy importer in the world after local stock positions normalised in 2016. The demand growth is in UHT milk, mozzarella and cream cheese.

The IDF report backed up a recent report from Rabobank that said dairy-exporting regions were fighting to win market share in Asia's cheese market.

The Rabobank report — *Asia's Fast-Moving Cheese Markets — Australia's Race to Win* — said Asia offered "a compelling growth opportunity" for Australian dairy exporters in the medium term.

But it warned other exporting nations — with a much larger production base and export potential — were also looking to expand their presence in the Asian region.

Rabobank senior dairy analyst Michael Harvey said competition was set to intensify as leading cheese manufacturers in New Zealand, the US and Europe invested in production capacity. "Over the next three years, we will see this new processing capacity come online, which potentially be more than sufficient to service the Asian markets," he said.

Australia needed to play to its strengths and focus on maintaining and growing market share in the high-end segments of the market.

Citing investment in dairy innovations and formulations as the way forward, Mr Harvey said tailored products could include improved functionality and desirability (to suit local cooking styles), clean label initiatives, nutritional demands (such as additive free, sodium reduced) and the development of snacks tailored to local consumers.

"But much of Australia's ability to grow exports into the Asian region will hinge on the sustainable growth of our milk supply," he said.

"And, while possible, growth prospects are up against hard constraints and seasonal impediments at the moment."

The concerns about Australia's exports were backed up by an Organisation for Economic Co-operation and Development and Food and Agriculture Organisation report released in July.

The *OECD-FAO Agricultural Outlook 2018-2027* report forecasts world milk production to increase by 22 per cent in the next 10 years. But most of that growth would come from Pakistan and India and most would be consumed domestically in those countries as fresh dairy products.

Michael Harvey: competition set to intensify as leading cheese manufacturers in New Zealand, the US and Europe invest in production capacity.

Overall growth in world milk production was expected to average 1.8pc per year for the next 10 years, compared with 2.1pc per year during the previous decade.

The report said the four major exporters of dairy products were New Zealand with a share of 32pc, the EU (24pc), the US (12pc) and Australia (6pc).

It forecast a decline in export share for Oceania (New Zealand, Australia) from 38pc to about 33pc in 2027. Export shares were forecast to increase slightly for the US, the EU and Argentina.

The OECD-FAO report said world prices of dairy products would be supported by strong but slowing demand increases for milk and dairy products.

The dominant destinations for dairy exports would be developing countries, with the Middle East and North Africa region accounting for 24pc of world imports in 2027, South East Asia for 12pc and China for 13pc.

The report said China would remain a major importer of dairy products and was projected to increase its imports over the next decade but at a slower pace. But it said there was uncertainty about China's role as an importer. "Small variations in domestic production and consumption can have a significant impact on the world market, as shown in 2011-2015 period when the country's imports of whole milk powder expanded and then decreased rapidly," it said.

Rabobank sees China as a key opportunity. "China is where the growth opportunities lie for Australian cheese exports, with China's annual cheese imports set to potentially double by 2023," Mr Harvey said.

China's cheese imports grew at a rate of more than 20pc per year between 2012 and 2017.

Mr Harvey said in the same period imports from the ASEAN-5 countries of Indonesia, Malaysia, Thailand, the Philippines and Vietnam grew by 10pc per year.

Growth was slower in Japan and Korea (at an annual rate of 2pc), but these two countries, together, import three times more cheese than China (importing 340,000 tonnes in 2017, compared with China's 100,000 tonnes).

But while the outlook was strong there were "downside risks", including the trade war between China and the US and margin pressure on retail foodservice chains.

The Rabobank report said while Australia was well-placed to be an integral part of global quick service restaurant supply chains, "the competitive environment is rapidly changing as other exporters also look to expand their presence in the region".

"New Zealand has set the pace in terms of growing cheese exports to Asia, and now supplies half of China's cheese import requirements," Mr Harvey said. "While in the Northern Hemisphere, a number of countries have expanded cheese production to absorb the oversupply of milk and to generate better returns from cheese versus milk powder."

Mr Harvey said to succeed in its industry-wide Asian strategy for cheese and whey-derived nutritionals, Australia must play to its strengths, as a reliable supplier of high-quality product.

The immediate priority for Australia to increase its cheese exports lay with the industry sustainably increasing milk production and improving plant utilisation. While possible, and Rabobank forecasts a modest growth in milk supply in the next five years, there were many headwinds to achieving this, particularly in light of the current season, Mr Harvey said.

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Minister flags supermarket reform

Key points
- ✔ Supermarkets introduce drought levy on limited range of milk
- ✔ Accused of publicity stunt
- ✔ Minister flags market reform

By **Andrew Marshall**

AFTER a week in mid-October of verbally savaging supermarkets over their milk pricing tactics and drought publicity "stunts", Agriculture Minister David Littleproud flagged major milk market reforms were in the wind in a bid to bring the powerful retailers to heel.

Mr Littleproud said he was looking at how to revamp rules around supermarket contracts with processors, with the aim of strengthening market pricing options for processors and farmers.

Reform proposal details are likely to be released by February and are expected to receive sympathetic backing from federal cabinet.

"The fact is the milk market needs real reform. It's not working," he said.

Processors were intimidated by the bargaining strength of retailers, while farmers had few bargaining options with anybody in the supply chain.

His move, in consultation with key dairy sector players, follows recent agreement for a mandatory code of conduct between producers and dairy processors.

'The fact is the milk market needs real reform. It's not working.'

Mr Littleproud said the milk market was clearly broken and the big supermarkets could no longer "wash their hands and claim the fact farmers are going broke is nothing to do with them".

"I've already begun work on a mandatory code of conduct for the sector since dairy farmer groups called for it, but much more reform is needed," he said.

"Farmers say the mandatory code for processors and farmers will be a good thing, but supermarkets need oversight too.

"That makes sense to me."

Australian Dairy Farmers chief executive officer David Inall said Mr Littleproud amplified farmer concerns and public sympathy, particularly with his stinging rebuke of Coles, when he branded the supermarket's drought help milk price policy as "half-baked" and "a stunt".

Mr Littleproud joined a growing chorus of critics blasting Coles's 10-cents-a-litre milk levy on three-litre bottled house brand milk, saying it was a farce hastily announced after rival Woolworths launched its own special "drought milk" range to raise 10c/litre for its drought-whacked milk suppliers.

German-owned discount retailer Aldi came in for even harsher commentary from the minister for selling "very cheap milk" and doing "bugger all" to help the industry or participate in any type of dairy reform.

"The big German should take a running jump if they can't be bothered to support Australian dairy farmers," Mr Littleproud said.

Aldi responded saying it did not support short-term levies, which may artificially alter market dynamics, but welcomed "government-led industry reform".

"The health and viability of the dairy industry is a conversation worth of national attention," a spokesman said.

"When Mr Littleproud first proposed a government-led initiative to support the dairy industry, we signalled our support, should it be implemented. Our position remains the same."

But Victorian Nationals MP, Andrew Broad, said he believed the community was growing cynical about supermarket promises to help farmers when in reality they were doing little or even making their plight worse with current pricing policies.

ADF's Mr Inall said there was no question about the deep degree of distress among dairy farmers towards retailers and their milk pricing attitudes, especially $1/litre house brand milk. "This topic is also attracting a lot of public interest and considerable political attention," he said.

While farmers accepted retailers wanted to service their customers, the drought had highlighted extreme production costs which milk producers paid while milk returns had basically flatlined since Coles undermined retail prices in 2011 by introducing $1/litre milk.

"Dollar milk ushered in a race-to-the-bottom mindset — retailers need to see the big picture here," Mr Inall said.

"To be a successful and prosperous industry, retailers must let farmers share in the returns they deserve."

Unlike beef or grain farmers, milk producers could not hold product off the market if prices were poor and must keep milking when seasonal conditions were tough.

"We urgently need a shift in retail pricing that reflects reality and adds value to the entire dairy cabinet, including phasing out $1/litre milk and cheap cheese," he said.

NSW Farmers Association argued supermarket drought levies were marketing ploys designed to keep extreme dairy discounting alive even longer.

Dairy committee chairwoman Erika Chesworth said producers were at breaking point and Coles's drought fund had delivered more anger and anxiety than help.

"For years retailers' actions have eroded value from the NSW dairy industry and it's offensive farmers now need to apply to access these funds," she said.

"Coles's drought program is not genuine, it only applies to a limited range of products, and farmers must supply sensitive information such as individual milk statements to access any funds."

Queensland Dairyfarmers' Organisation said consumers might buy into these "ridiculous PR stunts" thinking they were doing the right thing, but Coles and Woolworths were actually capitalising on the drought for their own gain.

Australian Dairy Farmers chief executive officer David Inall says there is no question about the deep degree of distress among dairy farmers towards retailers and their milk pricing attitudes, especially $1/litre house brand milk.

"The drought levies apply only to their private labels," executive officer Eric Danzi said.

"It's a sign of their corporate greed that the price increase initiative across all sizes and brands, which we're campaigning for to help struggling farmers, should be manipulated to grow retailers' own market share. Truly, they should be ashamed."

Managing director of Coles's parent company, Wesfarmers, Rob Scott, was disappointed by Mr Littleproud's spray, and felt he and other critics did not fully appreciate the retailer's intentions.

"Coles has done an enormous amount to support our farmers," he said referring to $12 million-plus in drought support already paid by the supermarket. "Customers also have the choice of what milk to buy, but many are very price-focused and trying to make their household budgets go further," he said.

Coles claimed a 10c/litre levy on all fresh milk would cost Australian consumers $250 million annually.

"That cost would fall disproportionately on the 40 per cent of households with only $150 a week to spend on their weekly grocery shop," a Coles spokesman said.

Coles was receiving "a steady stream of applications" from dairy farmers for a share of its contentious 10c/litre levy on house brand milk.

Aldi said it was working directly with suppliers to ease drought cost pressures, accepting farmgate price increases, which had not been passed on to customers.

"Without a transparent, auditable and equitable process for funds collection and distribution, we believe it would be irresponsible of Aldi to tax consumers on the purchase of milk," the spokesman said. D

How to make a wise bedding choice

Key points

- ✔ Plan bedding choice before starting construction of housed-cow facility
- ✔ Several factors need to be considered
- ✔ Select bedding that suits farm, its location and management

By **Dr Sarah Chaplin and Dr Yvette Williams**

THE choice of bedding system and the type of bedding materials used in cow housing facilities will have a substantial impact on the management, and even design, of that facility.

Dairy farmers who are planning a new development of a house facility should consider bedding before they start to build, not after.

Bedding choices are driven by several different factors:

- Materials readily accessible in the required amounts and at a suitable cost.
- Information and recommendations provided by local consultants and salespeople.
- Local climatic conditions and expected variations in weather.
- The bedding systems and materials that have been traditionally used in the industry.
- The operator's skills to manage the bedding system.
- The farm's ability to handle the bedding waste.

As observed in the first article in this series in the May-June edition of the *Australian Dairyfarmer*, whether dairy cows are housed in a freestall barn or kept in some form of loose housing, the purpose of providing bedding is to create a comfortable lying surface that encourages cows to lie down, and to keep the cows clean and healthy.

If the lying surface is not comfortable, cows may spend less time lying down or have a more disturbed pattern of lying behaviour. Shorter lying times in housed systems have been associated with lameness, while cows that spend more time standing in slurry are also at risk of other foot conditions such as slurry heel. Apart from the obvious welfare issue of lameness itself, lame cows produce less and are harder to get in-calf.

'The purpose of providing bedding is to create a comfortable lying surface.'

Dirty cows and a soiled bedding surface are risk factors for clinical and subclinical mastitis. Every dairy farmer knows that these reduce milk quality and have direct, and avoidable, impacts on milk income.

A bedding depth that is inadequate or bedding that has been allowed to compact can increase the presence of skin injuries on the cows, particularly on the knees or hocks. Skin injuries can range from small areas of hair loss to open wounds, infection and joint swellings.

The bedding systems used for freestall barns are usually deep-bed or mattress-based systems. For loose housing barns, a deep-litter system can be used, and compost pack systems are becoming popular. In each of these bedding systems a range of different bedding materials can be used successfully.

When choosing a bedding system and type of bedding material, it is important to consider how the bedding will be managed on a daily basis, what interaction it will have with the effluent-management system, and how the waste bedding will be handled once removed from the housing. Every bedding material type has its own costs, benefits and management challenges.

The local climate will also need to be considered. Compost pack systems rely on careful management of heat and moisture in the compost pack, particularly in dry, wet, hot or humid conditions. In areas where heat stress needs to be managed, thought needs to be given to how the cooling system will interact with the bedding. For example, use of a water spray or evaporative cooling will increase moisture levels whereas cooling fans do not rely on water. Sand bedding will conduct heat away from cows whereas some forms of compost bedding will generate heat.

A local supply will be needed that can be affordably and easily accessed. A farmer doesn't want to design a bedding system around a bedding material that is only available sporadically or where the price varies markedly.

Here are some general comments about different bedding types:

- Sand is often considered the gold standard for deep bedding in freestall barns. Sand is inorganic, so bac-

teria is less likely to grow in the bedding, assisting with mastitis control, and generally a deep sand bedded freestall can be comfortable (provided the design and dimensions of the freestalls are suitable). Sand can, however, be hard to handle in some effluent systems, and may be hard to source in some areas of the country. A well-planned and designed freestall barn and effluent management system can allow sand bedding to be efficiently recovered and re-used.

• Organic materials, such as sawdust, straw, woodchips, wood shavings, shredded paper, dried manure, bark, seed hulls (e.g. rice, almond, etc.), can be used effectively for deep bedding. Dried sawdust and wood chip is usually preferred over green wood sources, as the dried bedding can absorb more moisture than the green bedding. Dusty bedding can lead to eye and respiratory problems and, of course, it is important to avoid any materials that may be toxic when ingested. Used organic bedding material can also be dried and re-used or composted following a specific standard and then re-used.

• Mattresses or rubber matting can be used in freestall barns to provide a cushioned lying surface in each stall, but they need absorptive bedding added on top to soak up moisture and keep the cows clean. Some research shows that mattresses are associated with a higher incidence of lameness than sand bedding. Waterbeds are another synthetic option that also need an absorptive layer but have been reported to help cows manage heat stress.

• Straw has traditionally been used in deep-litter bedding systems. It performs well as a bedding material provided moisture levels at the bedding surface can be kept low. Less severe hoof disorders and reduced wear have been reported for deep-litter bedding systems compared with freestall barns, although different hoof disorders may be more prevalent. Very large amounts of straw are required: 7-18 kilograms per cow per day has been recommended, which equates to about 1 tonne per day per 100 cows.

• Many different organic materials can be used for a compost pack system, provided they maintain a coarse particle size, don't clump together or compact excessively, and can be tilled easily. They also need to be readily absorbent. Care needs to be taken with some wood types as they have antimicrobial properties that reduce the effectiveness of the composting process, and some have the potential to cause diseases such as laminitis.

• Although less bedding overall is required in a compost pack system, compared with deep litter systems, it takes a lot of skill and attention to maintain the compost

Farmers need to make sure that they make an informed choice and end up with a bedding that suits their farm and their management, and that keeps their cows clean, comfortable and healthy. D

Contact: Dr Sarah Chaplin, phone 0439 275 896, email <sarah.chaplin@ecodev.vic.gov.au>.

******Dr Sarah Chaplin is Agriculture Victoria's development specialist (animal performance) and Dr Yvette Williams is an Agriculture Victoria research scientist (dairy nutrition).*

Anthony and Wendy Eccles, Purnim, Western Victoria, have reaped the benefits from investing in their herd's genetics.

Value adding through genetics and data

Key points

- ✔ Herd bred to AI for 50 years
- ✔ All heifers genomically tested
- ✔ Surplus stock sales contribute 20 per cent of farm income

ANTHONY and Wendy Eccles have a passion for breeding productive, profitable dairy cows and an analysis of their herd by the ImProving Herds Project has shown their investment in genetics is a major contributor to their bottom line.

The Eccles milk 440 registered Holstein cows under the Purnim prefix, in a split-calving herd at Purnim in Western Victoria.

Their farm was one of 27 dairy farms across Australia that recently underwent detailed analysis by the ImProving Herds project to investigate the contribution of genetics to dairy businesses.

The study identified the top and bottom 25 per cent of each herd, ranked on Balanced Performance Index (BPI), DataGene's genetic index for profit, and compared their performance in terms of production, longevity and financial contribution.

Ten years of historical performance data, plus recent farm financial data from the Eccles herd records were analysed to look at the difference in contribution to the farm business between the top and bottom BPI groups in the herd.

'Genomic testing heifers has taken the guess work out of deciding which heifers to sell.'

The study found the top 25pc of the Eccles herd, ranked on BPI, produced 744 more litres of milk per cow per year, as well as 55 more kilograms of fat and 42 more kilograms of protein than the bottom 25pc.

The extra milk production from the top 25pc of cows ranked on BPI resulted in an extra milk income after feed and herd costs of $482/cow/year compared with the bottom 25pc of the herd.

On average the top 25pc cent of cows also lasted in the herd 12 months longer than the bottom 25pc.

Breeding

The differences in the cow performance based on genetic merit was no surprise for the Eccleses, whose herd has a 50-year history of using artificial insemination, which started with Mr Eccles's father who was an inseminator.

"We have a closed herd and have used AI on everything for a long time," Mr Eccles said.

"Having a closed herd has allowed us to also have Johne's Disease-free status, which is invaluable when selling surplus stock for export markets and to other farmers who value the effort we have made in our genetics."

The herd split calves, with 60pc calving down in autumn and 40pc in spring and all cows have collars for identification and heat detection.

"We have a 44-unit rotary with a computer system that reads each cow's collar when she comes onto the platform and then allows the cow to be fed individually according to her stage of lactation — whether she has just calved, is in mid lactation or in

Table 1: Eccles farm stats (July 2018)

Herd size	440 cows
Breed	Holstein
Farm size	240ha milking areas plus 80ha for young stock
Calving pattern	Split 60% autumn/40% spring
Dairy	44-stand rotary
Staff	3 full time and one part-time work with the Eccles as well as two casuals who help with milking on weekends
Feeding system	Individual feeding in the dairy
Herd testing history	Always herd tested

The top 25 per cent of the Eccles herd, ranked on BPI, produce 744 more litres of milk per cow per year, as well as 55 more kilograms of fat and 42 more kilograms of protein than the bottom 25pc.

Anthony Eccles likes to feed high-producing cows to their genetic potential.

late lactation," Mr Eccles said.

"It allows us to feed high-producing cows to their genetic potential, which is important when you breed for production."

The herd is joined to 100pc artificial insemination to a mix of sexed and conventional semen with bulls selected for high BPI, high daughter fertility and good type (medium size animals with good legs and feet).

High-ranking genomics cows are selected for breeding with sexed semen. Sexed semen is used on about 90pc of the heifer joinings.

All bulls used in this year's bull team — across cows and heifers — are genomically tested with an average BPI of 335.

"In recent years we've decided to go down the A2 path and have been using A2 bull teams to increase the A2 content in our herd," Mr Eccles said.

"I'm really interested in breeding, so we also flush our best cows to maximise the number of offspring they produce. The first flush will be to sexed semen and then the second flush will be to conventional semen."

Genomics

The Eccleses have been genomically testing all heifer calves for the past four years and used the results, along with an assessment of each heifer's pedigree and conformation, to identify replacements.

"Genomic testing heifers has taken the guesswork out of deciding which heifers to sell," Mr Eccles said.

"Genomic testing has the added advantage of verifying a calf's parentage, which can sometimes be a bit of an issue when you have a lot of cows calving on one day."

Tail hair sampling coincides with disbudding at 6-8 weeks of age and the genomic results are typically available within one to two months.

The tail hairs also go through the A2 gene test to identify suitable heifers for the transition to an all A2 herd.

The Eccles also rear 12-20 bull calves a year that result from flushing the best cows in the herd.

"We don't use mop-up paddock bulls with the herd, but we do use semen from our own bulls," Mr Eccles said. "We use the semen collected from our bulls on cows we do not wish to breed from for our herd due to age or type."

These bull calves are also genomically tested, with potential future sires identified, or grown out to 10 months of age and sold to other dairy farmers as mop-up bulls. Higher genetic merit bulls may be bought by semen companies if they are suitable.

Replacement heifers

About 180 heifer calves are reared a year and grown out to 8-10 months, with 90 selected to go into the herd.

"We pick out the heifers we want to keep based on their genomic results for BPI, their cow families and their conformation," Mr Eccles said.

The replacement heifers are joined to sexed semen and the surplus heifers sold before they need to go out on agistment.

"When it comes to joining our replacement heifers, I'll also look at their genomic results; if a heifer is a bit low on fertility then I might give her conventional semen rather than join her to sexed semen," Mr Eccles said.

"We aim to grow out all our heifers really well, so we have good conception rates in our heifer replacements and our surplus heifers are looking good when we are selling them to other farmers at 10 months. "We haven't sold surplus heifers into the export market for the past three years because we have other dairy farmers who want to buy them.

"We can show these farmers each heifer's pedigree, their genomic Australian Breeding Values, their A2 content, their disease-free status and their dam's herd test data.

"When you have that sort of information, it's easy to sell good quality heifers and we have farmers who are repeat buyers because they can see the value of our breeding program and the difference it makes in their herds."

The Eccleses also sell surplus cows to maintain the herd size and these cows are often sold off as younger milkers who are culled on type.

"We've taken an approach where we try and add value to our surplus stock and are aiming for sales of heifers, surplus cows and bulls to be 20pc of our total farm income," Mr Eccles said. "Our accountant likes the approach we have taken — it looks good on paper because we have a high-value herd that has become a significant asset."

For more information, contact DataGene, phone (03) 9032 7191 or email <abv@dat

Dairy Australia
Your Levy at Work

Campaign promotes dairy for bones

Key points

- ✔ New campaign raising awareness that dairy is one of the best sources of calcium and other bone-building nutrients
- ✔ Dairy Australia survey shows Australians neglecting their bones
- ✔ Australians encouraged to eat dairy to strengthen bones

Australians of all ages need to have adequate calcium intake, adequate vitamin D levels, and regular weight-bearing exercise.

DAIRY Australia has launched a new campaign to help address the lack of action by Australians around their bone health, reminding them that dairy milk, cheese and yoghurt are some of the richest sources of calcium, as well as a package of other bone-building nutrients.

The bone health campaign is encouraging Australians of all ages to embrace the habits needed to improve and maintain bone health.

Branded the 'Bone Matters' campaign, it will feature a six-week bone health challenge, articles and advertising that will appear in the online news sites *Mamamia* and *The Guardian*, as well as a social media campaign.

The campaign comes in response to a Dairy Australia survey, conducted during this year's Healthy Bones Action Week, that revealed significant levels of apathy around bone health.

According to Dairy Australia, about 14 million Australian adults may be neglecting their bone health, putting them at risk of fractures and osteoporosis. The survey revealed up to four in five Australians neglect the three important lifestyle steps to improve bone health — calcium by consuming dairy foods, vitamin D from safe, sun exposure and weight-bearing exercise.

The Dairy Australia commissioned report surveyed 1017 Australians about their thoughts and perceptions towards bone health and dairy consumption. The survey asked Australians aged 18 and over, living throughout Australia, 10 questions relating to their attitudes and habits.

The study also found more than half of those surveyed (56 per cent) are not concerned about osteoporosis and only one in 20 ranked bone health as their number one priority with heart, brain and skin health instead topping the list of priorities for most respondents.

Professor Richard Prince, a bone health expert from the University of Western Australia Medical School in Perth, said the results suggested that people needed to take bone health more seriously.

> ***'The truth is that Australians of all ages need to have adequate calcium intake...'***

"Because bone loss commences after age 25, Australians need to do more to look after their bone health throughout life to reduce their risk of osteoporosis," he said.

According to the survey, 92 per cent of parents believed their children were getting enough calcium, vitamin D and exercise. However, while nine out of 10 parents acknowledge dairy was an important source of calcium, the report suggests that in reality only one-third of children consume the recommended daily serves of dairy foods.

Dairy Australia dietitian Emma Glassenbury said the importance of nutrition education for bone health was fundamental for children.

"Understanding what their bones need is the first important step for all school children," she said. "By educating children early, we can set them up for the long run."

Despite government dietary guidelines recommending dairy foods, such as milk, cheese, yoghurt or alternatives, are consumed throughout life, three in five Australians believed that it was more important for children to have dairy than adults.

"The truth is that Australians of all ages need to have adequate calcium intake, adequate vitamin D levels, and regular weight-bearing exercise to support their bone health," Ms Glassenbury said.

Help Dairy Australia spread the word about the importance of bone health throughout all stages of life by liking or sharing the campaign on social media or posting an image of yourself doing a healthy bone activity with the hashtag #bonesmatter. D

More information is also available at <http://www.healthybones.com.au>.

Keeping flavoured milk on the menu

Key points

- ✔ Report highlights why flavoured milk should be encouraged in balanced diets
- ✔ Can provide vital source of calcium
- ✔ Report shared with dietitians and policymakers

A NEW report from Dairy Australia has highlighted the important contribution flavoured milk can have as part of a balanced diet.

In an effort to pull together the scientific research, the Dairy Australia report outlines six key reasons why flavoured milk should be encouraged in the diets of children and adolescents.

The report notes alarming statistics that show 39 per cent of energy intake comes from junk foods, despite research showing that flavoured milk provides the nutrition needed during childhood and adolescence.

While some consumer groups continue their campaign against added sugar, research is showing that the entire food matrix matters more than single nutrients, such as sucrose.

Dairy Australia's Melissa Cameron said both plain and flavoured milk improved diet quality and were part of the Five Food Groups that made up the Australian Dietary Guidelines.

"Flavoured milk helps increase recommended serves of the dairy food group," Ms Cameron said.

"Research shows consumption of flavoured milk is linked to eating less junk foods, better diets and improved nutrient intakes."

Dairy Australia's report on the nutritional value of flavoured milk.

The report showed dairy foods contributed essential nutrients, such as calcium, especially during adolescence.

Including flavoured milk in the diet also improved variety, which increased the likelihood that children and teenagers would meet their recommended number of dairy serves per day.

Currently, eight out of 10 children and teenagers do not consume enough dairy.

Also highlighted are studies in both Australia and the United States, which have shown that despite containing added sugar, flavoured milk does not lead to weight gain or changes to body mass index.

The Dairy Australia report has been shared at the Dietitians Association of Australia conference, and the findings have been provided to policymakers, dietitians, nutritionists and processors.

The research is fuelling public trust in the dairy supply chain from farm to fridge and ensuring all types of dairy remain relevant to healthy diets in the future.

"Ready-to-drink flavoured milks come in a range of flavours and sizes to appeal to everyone's taste," Ms Cameron said.

"But regardless of your favourite flavour, what we continue to see is that flavoured milk can act as an important vehicle for increasing consumption of the dairy food group."

Dairy Australia is also continuing to collaborate and consult on a range of health and nutrition issues, including recently lodging a submission on added sugar labelling with the Australian Department of Health.

"While added sugar labelling on foods and beverages may help to improve dietary habits, evidence suggests labelling alone will not be enough," Ms Cameron said.

Following the release of its flavoured milk report, Dairy Australia is developing a second report, which will highlight the health benefits of flavoured yoghurt as a Five Food Group food. D

ADC captures the entire dairy-farming spectrum from farmers, processors, industry representatives, service providers and the scientific sector.

'We have identified that as an industry we need to be bold and brilliant to overcome obstacles and promote ourselves.'

Be bold, be brave and be brilliant

AUSTRALIA'S dairy industry is set to tackle some of the biggest issues facing the sector head-on at the Australian Dairy Conference in Canberra next February 19-21.

A bold and strong agenda focusing on leadership, antibiotic use, bobby calves, genetics and dairy diet wars is set to generate contentious debate as the nation's dairy industry equips itself to tackle these big issues in the future.

Experts from around the globe have been invited to shine light from their independent perspective on where the Australian industry is placed, how well it is positioned for the future and to impart key learnings from global best practice.

ADC 2019 programming chair Susan Wearden said that the program line-up was specifically tailored around the issues having the most impact on the dairy industry now and into the future.

ADC snapshot

- ✔ For farmers by farmers
- ✔ Australia's premier dairy event
- ✔ ADC community of 1200+
- ✔ Farmers to CEOs and global innovators
- ✔ Highly valued by the Australian dairy industry
- ✔ Global reputation for excellence
- ✔ Supported by Australia's major dairy players
- ✔ Encouraging industry best practice
- ✔ Investment for your business

"With growing consumer trends around the world and opinions towards milk-based products within the marketplace, we have identified that as an industry we need to be bold and brilliant to overcome obstacles and promote ourselves," she said.

"Strong leadership is critical in this endeavour and so ADC 2019 kicks off with prominent leader perspectives before knuckling down into societal trends, on-farm applications and broader industry impacts.

"As an industry rather than shy away from these issues we are going to explore, debate and discuss so that the best outcome can be achieved moving forward.

"The focus of this year's program is to really challenge thinking about ▶

◀ what we do on farm, why we do it, question whether we can we do it better, and explore what impacts do my actions have on the broader industry."

It's a program for the entire dairy industry ranging from dairy farmers, processors, leaders and service providers, and an opportunity for them to be at the forefront of sustainable best practice.

"Part of the appeal of ADC is the ability to address content and deliver speakers that the dairy industry would not normally have the opportunity to hear from or access and we believe we have captured this essence and tone for Canberra 2019," Mrs Wearden said.

Highlights and major topics for the 2019 ADC program in Canberra include:

• Bold leadership — insights and perspective from leaders including Dr Brendan Nelson (former Defence Minister and curator Australian War Memorial) and Dairy Australia managing director Dr Dave Nation.

• Behind the farm gate — antibiotics and bobby calves — NZ case studies on minimising antibiotic use, dairy farmer best practice including Dr John Penry (Anexa/Cognosco) and Jo Coombe (Dairy Australia).

• High tech dairy farming — genomics and productivity gains via genetic data including Professor Andrew Cromie (Irish Cattle Breeding Federation) and Jared Ireland and John Pekin (Australian dairy farmers).

• Insight into the world of milk processing — Rabobank's Mary Ledman shows a global example of processor and supply base with mutual respect. Then a panel of executives from Australia's fiercely competitive dairy companies take to the stage hosted by Rabobank's Michael Harvey.

• New frontiers in the diet wars — how real is the threat, how alternative are alternative milks and the value of speaking the consumer language including Dr Judith Bryans (International Dairy Federation), Dr Anneline Padayachee (Simple Scientist) and Melissa Clark Reynolds (Beef and Lamb NZ)

• Farming from our phones — Young Dairy Network members showcase some of Australia's best dairy farm apps.

• Dairy Elders — Irish expert Dr Nollaig Heffernan talks about the Australian quality of resilience while journalist and broadcaster Virginia Haussegger interviews three dairy hero women sharing their stories of resilience, strength, endurance and wisdom to close the conference.

More information regarding ADC Canberra 2019 is available at website <www.australiandairyconference.com.au>.

Registrations for ADC Canberra 2019 opened in early November.

Pre-conference tour

Central NSW

Sponsored by Maxcare and Daviesway

Monday, February 18, and Tuesday, February 19

ADC takes delegates on a revealing tour to one of Australia's leading and biggest dairy farms Moxey Farms at Gooloogong, NSW, with farm tour, discussions and dinner on site.

Tour attendees will overnight at Cowra before heading to Colin Thompson's (ADC 2018 presenter) dairy farm with strong themes of resilience and ingenuity in his 320-Holstein milking operation.

The new biodigester under construction at Moxey Farms at Gooloogong, NSW. The biogidester is sure to be of interest to ADC delegates on the pre-conference tour.

Why ADC?

THE Australian Dairy Conference is an event for farmers by farmers.

Created by a group of pioneering farmers as a forum to push boundaries and dairy thinking, the not-for-profit organisation has evolved into Australia's premier annual dairy event continuing to challenge and contest the status quo.

ADC captures the entire dairy-farming spectrum from farmers, processors, industry representatives, service providers and the scientific sector.

Invest in your dairy business and join a growing community of like-minded dairy professionals in Canberra 2019.

Program highlights at a glance

Tuesday, February 19

ADC First timers event — hosted by the 2019 Programming Committee
ADC Welcome Function — hosted by Fonterra

Wednesday, February 20

Bold Leadership

Dr Brendan Nelson - Australian War Memorial and former Defence Minister
Dr David Nation - Dairy Australia managing director

Behind the Farm Gate

Setting the antibiotic scene - Jo Coombe, Dairy Australia
The New Zealand antibiotic experience - Dr John Penry, Anexa/Cognosco
On-ground antibiotics story - vet Dr Peter Degaris and dairy farmer Peter Hanrahan
Panel discussion - What is the bold leadership the Australian dairy industry needs to take in terms of guarding our animal health future?
Beefing up the response to bobby calves - Dr Sarah Bolton, Nuffield Scholar
The cost of being green - Ken Kimber, Bega dairy farmer and ADC founding director

High Tech Dairy Farming

Genomics - Prof Andrew Cromie, Irish Cattle Breeding Federation
Genetics that takes you places - Australian dairy farmers Jared Ireland and John PekinMaking the most of what genomics offers

Young Dairy Scientist

Finalists in the Young Dairy Scientists Award sponsored by Boehringer Ingelheim present their work and field of research.
Led by ADC scientific director Richard Rawnsley.

Australian Dairy Conference gala dinner

Hosted by Rabobank

Thursday, February 21

ADC annual general meeting

An Insight into the World of Milk Processing

An outsider perspective - Mary Ledman, Rabobank global dairy strategist
Processing things differently - executives from Australia's fiercely competitive dairy companies hosted by Michael Harvey from Rabobank

New Frontiers in the Diet Wars

How real is the threat? - Dr Judith Bryans, International Dairy Federation
Is truth the first casualty in the food wars? - Melissa Cameron, Dairy Australia
How alternative are alternative milks? - Dr Anneline Padayachee, Simple Scientist
The value of speaking the consumer language - Melissa Clark Reynolds, Beef and Lamb NZ

Farming from our phones

Australia's best farm apps presented by Young Dairy Network members and hosted by NSW DPI robotic dairy expert Nico Lyons.

Dairy Elders

Tougher than the rest - Dr Nollaig Heffernan, Irish expert the Heffernan Consultancy
Australia's dairying elders - journalist and broadcaster Virginia Haussegger interviews three hero dairy women. Their combined strength, endurance and resilience serves as inspiration for the challenges that lie ahead for the dairy industry's leaders of tomorrow

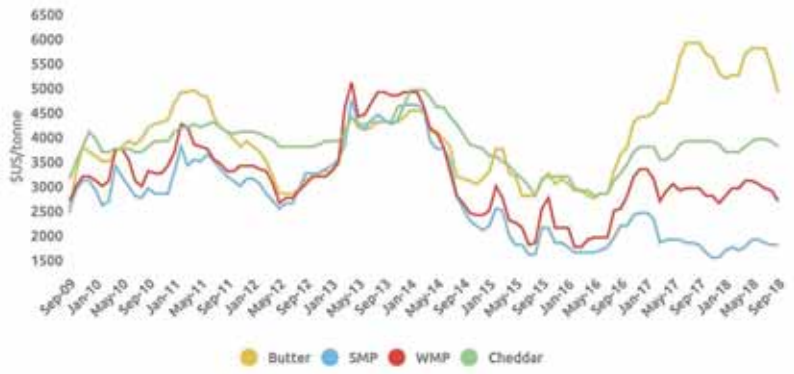
Poor season overrides market positivity

By **Sofia Omstedt**
Industry analyst
Dairy Australia

Key points

- ✔ Challenging conditions drive demand for hay, water
- ✔ Culling rate up 20 per cent
- ✔ Domestic and international markets favourable for Australian processors

Figure 1: Global dairy commodity prices



FOLLOWING a drier-than-average winter and start of spring, many farmers have seen soaring feed costs erase the benefits of better farmgate prices. The ongoing feed shortage, lack of rainfall and surge in culling rates quickly turned 2018/19 into a challenging season for Australian farmers.

At the same time, the wider dairy industry has been more settled, with healthy demand coming from both domestic and overseas markets. In the latest *Situation and Outlook* report, Dairy Australia draws out several key insights by looking at recent market developments domestically and globally.

Winter and the start of spring remained unseasonably warm and dry across Australia. These challenging conditions have continued to drive demand for hay, which in turn saw hay prices soar.

Demand came predominately from the drought-affected areas in NSW and Queensland. Data from the Dairy Farm Monitor Project, however, showed that virtually all regions have been affected by rising feed costs.

Supply is beginning to increase as new season crops enter the market and failed grain crops are cut for hay, nevertheless demand for hay remains strong.

The lack of feed across the country, combined with high costs of irrigation water and limited rain, resulted in a surge in culling rates. In the first three months of the season, roughly 20 per cent more cows passed through saleyards compared with last year. This increase represented both herd reductions and entire herd disposals. While hard data on farm exits is typically lagged, reports suggest farm exits have accelerated since the start of the season.

As Australian farmers are working through difficult conditions, other major dairy producers have increased milk production in the past few months.

In Europe, farmers experienced a challenging year, with a cold winter followed by a hotter-and-drier-than-average summer, which slowed milk production.

Despite these climatic challenges, reports suggest milk production has not been impacted as much as previously expected. In recent months, European commodity prices have started to weaken as product supply strengthens.

Milk production in the United States also increased in August, up for the 18th consecutive month.

New Zealand is the major supply influence at present, as the country experienced highly favourable winter weather. The current conditions, together with profitable farmgate prices, are setting New Zealand farmers up for a strong season.

While weather and feed issues have dominated the current news, other parts of the supply chain created a more stable picture. The Australian domestic market for dairy products has remained largely stable, with all key product categories showing value growth, and all but dairy spreads seeing increased volumes sold.

Within categories, drinking milk consumption has continued to shift in favour of full cream milk, and the recovery in private label sales has persisted. Fresh milk has made gains over UHT, while flavoured milk grew 5pc, outpacing the broader category's 1pc increase.

Private-label cheese is closing in on half the market share of the chilled cheese market, while higher-value deli cheese has also grown in popularity.

The yoghurt category has continued its return to growth, driven by strong growth in the 'traditional yoghurt' category. Probiotic yoghurts have also seen resurgent growth, albeit off a low base.

Higher prices reflective of global demand for dairy fats continued to weigh on butter sales volumes, however inelastic demand overall saw sales value in the dairy spreads category grow more than 18pc in the last 12 months.

Global dairy demand also remained strong. Total exports from the six largest exporters grew 3.7pc for the 12 months to July. Part of this growth was driven by an increase in demand from China and Japan (both up about 10pc in volume terms).

Demand for dairy also increased in the Middle East/North Africa (MENA) region for the first time in more than three years. Australian exports increased 4.1pc to 745,000 tonnes, driven by strong growth in liquid milk sales and infant powder exports.

Growing demand for Australian dairy products serves as a reminder of the longer-term opportunities of the industry. Nevertheless, given current conditions, for many farmers seeing their way through the more immediate challenges will be the priority this season.

With the ongoing feed shortage, surge in culling and unfavourably rainfall forecasts for the remainder of 2018, the outlook for this season is quickly deteriorating. D

Around the field days

Australian Dairyfarmer's **Jeanette Severs checked out the range of new and interesting products and services on show at the South Gippsland Dairy Expo in September, while Peter Roach caught up with suppliers at the Elmore Field Days in October.**

Jay Jaspers had his son, Caleb (4), with him at the South Gippsland Dairy Expo to show the Civil Mart crossover kit for driveways.

Inside the Goweil bale grab, hooked to a John Deere 5100R tractor, at the South Gippsland Dairy Expo is Jayson Filomeno, Cervus Equipment, Leongatha, Vic.

Known for VicSilos, at Maffra, Vic, Graham Watt also displayed sheep and cattle troughs at the South Gippsland Dairy Expo.

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Teat care and dairy hygiene specialists Ruakura were at Elmore Field Days. On hand to demonstrate their new teat scrubber were Don Hanson and Glen Armstrong. For more information visit <ruakura.com.au> .

Tez, Trevor and Clare Porter, Yarram, Vic, are looking at equipment and machinery at the at South Gippsland Dairy Expo.

Pictured at the Semex Australia tent at the Elmore Field Days discussing Semex's range of unique genetic solutions are area manager Ashley Bradley, dairy farmer Casey Diment, Stanhope, Vic and key account manager Joseph Holloway.

Representing Burra Foods with some old style milk cans at the South Gippsland Dairy Expo are milk supply manager Peter Fort, milk supply officer Paul Bills and farm milk administration officer Ann MacKay.

Showing their cast cement feedpads and bunkers at the South Gippsland Dairy Expo are Toby and Gordon Painter, Vikon Precast, Bairnsdale, Vic.

A Cleris linkage fertiliser spreader caught the eye of Morry Van De Leur, Menzies Creek, Vic, at the South Gippsland Dairy Expo. He is pictured with Tom Paltridge, Muck Runner, Mt Gambier, SA.

Mitch Colson, of Warrnambool, Vic, looks at the Wrangler Crush, brought to the at the South Gippsland Dairy Expo by Laurens De Wit, of De Wit Trading.

At the Rabobank stand at the South Gippsland Dairy Expo are Sam Loughridge, Ripplebrook, Vic, Andrew Wood, Warragul, Vic, Rabobank's Russell Mann and Matthew Long, Colin Finger, Ripplebrook, Vic, and Jamie Murphy, Rabobank.

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Stoney Creek, Vic, dairy farmer Daryl Sinclair, flanked by Jannine Brennan and Jon Reynolds, of Provico, talk about calf milk replacer and gut health at the South Gippsland Dairy Expo.

Alan Gowers, Vicseeds, and Simon Hunt, Stephen Pasture Seeds, with Choice Chicory, Tonic Plantain and Relish Red Clover on show at the South Gippsland Dairy Expo.

At Browns fertilisers' tent at the South Gippsland Dairy Expo, cake was on the menu, handed out by sales manager James Ristrom and agronomist Katherine Bohn.

Talking about Marco Turnips at the South Gippsland Dairy Expo are sales agronomist with Cropmark Seeds Adam Sheedy and seed agronomist with Notman Seeds Adam Fisher.

A farmer can never have too many hats: Steven Garnham, Nyora, Vic, says yes to another hat from Ridley Stockfeeds' Richie McGrath, Leongatha, Vic, at the South Gippsland Dairy Expo.

Showing the injector nozzle inside the liner to teat spray the teat at the South Gippsland Dairy Expo are Ken and Rose Heywood, of Western Valley Dairy Systems, Warragul, Vic, and Craig Kelly, of ADF Milking.

Elmore Field Days stalwart, Andrew Hoult from Dumac Distributors was on site again with their Ruffy range of effluent pumps and Ebara pressure system and washdown pumps.

Fonterra's Sarah Fusinato, of Neerim South, Vic, was helping people play milk pong at the South Gippsland Dairy Expo.

Representing GippsDairy and Dairy Australia at the South Gippsland Dairy Expo are intern Heather Smillie and extension officers Leah Maslen and Ashley Burgess.

At the South Gippsland Dairy Expo Donal Blackwell, Alltech, talks about the Keenan nutrition with Keenan Intouch, which uses cloud technology to log the feed inventory and supplements levels on the farm.

At the South Gippsland Dairy Expo, Robyn Mitchard of ACM with Zoe (9 months) and Brad Carpenter, Leongatha, Vic, Gendore, discuss the new McHale 991 high-spin bale wrapper with twin wrappers. Robyn Mitchard said ACM has acquired an annual production of 50 million litres of milk in Gippsland.

Graham Wood, of Graham Wood Machinery with a rehabilitator deep and surface tillage, with 1.5-6m working width, at the South Gippsland Dairy Expo.

Graeme Stoll, DairyTech, at the South Gippsland Dairy Expo with the Packo vat cooling systems, that are now manufactured in 30,000-50,000 litre capacity.

With crushed maize from Irwin's Stockfeed, Greg Pate and Katrina Galindo, South and West Gippsland sales representatives respectively.

Cows highly motivated to access a brush

Key points

- ✔ Mechanical brushes provide grooming points for housed cows
- ✔ Cows sought out brush in similar way to seeking feed

GROOMING behaviour is expressed by many animals, including cows, and helps them maintain a healthy coat and skin. Cows can groom themselves and herd mates by licking. When housed in naturalistic environments, they also use trees or other structures to scratch parts of their body that are otherwise difficult to reach.

On some dairy farms, cows do not have access to surfaces suitable for scratching themselves, but other farms are now providing cows with automated mechanical brushes that facilitate grooming behaviour.

When cows are allowed access to mechanical brushes, they are cleaner and spend about fivefold more time grooming than when brushes are not available, suggesting that these brushes are important for the cow.

To better estimate just how important access to an automated mechanical brush is to indoor-housed dairy cows, researchers at the University of Britsh Columbia's Dairy Education & Research Centre conducted a study designed to test the motivation of dairy cows to access a mechanical brush.

Motivation testing can be used to assess how important resources are to animals. In motivation studies, the willingness of animals to work for access to a resource of interest (in this case a mechanical brush) is typically compared with the animal's willingness to work for other resources known to be important for the animal (e.g. fresh feed).

A cow uses an automated mechanical brush at the University of Britsh Columbia's Dairy Education and Research Centre.

This allows researchers to compare the relative importance of the different resources to the animal. Animals are generally highly motivated to feed, so feed can be used as a 'gold standard' to compare with other resources.

In the experiment, cows were trained to push open a weighted gate. During training, cows were rewarded with some grain after successfully pushing open the gate. It took about a week until all the cows learned to successfully open the gate from a closed position.

After the successful completion of training, the test sessions started. In the test sessions, the weight that cows were required to push to open the gate was gradually increased, thereby increasing the "work" required to access either a mechanical brush, fresh feed (tested after 1.5 hours of feed deprivation; a resource researchers assumed that cows would be highly motivated to access), or an empty pen.

To determine if testing order affected motivation to access the brush, all animals were tested twice: once before (Brush I) and once after (Brush II) they had been tested for motivation to access the feed and empty pen.

To access an empty pen, 4 of the 10 cows tested were not willing to push any weight, and the maximum weight pushed by any of the cows to access the empty pen was 14 kilograms.

In contrast, cows were willing to push higher weights to access either food or the mechanical brush, with many cows pushing 23kg and some pushing 41kg or more to access these resources.

The weight cows were willing to push was similar for the mechanical brush and for the fresh feed, and the weight cows were willing to push to access the mechanical brush did not differ between the first and second test phase.

The results of this study show that cows are highly motivated to access a mechanical brush, about as motivated as they are to access fresh feed after 1.5 hours of feed deprivation, and more motivated than they are to access an empty pen.

These results indicate that access to a mechanical brush is important for dairy cows, and provides scientific evidence in support of the practice of providing cows access to these brushes. D

To see a video of a cow using the gate to access the brush visit <https://www.youtube.com/watch?v=DAAvnPFAEz0>.

For further information email <marina.vonkeyserlingk@ubc.ca> or <dan.weary@ubc.ca> or website <www.landfood.ubc.ca/dairy_centre>.

This report is based on McConnachie et al., 2018. Biol. Lett. 14: 20180303.

New dairy part of overall growth plan

Key points

- ✔ VAN Dairy Group at Woolnorth Station, Cape Grim, Tasmania
- ✔ 25 dairy farms
- ✔ Produces own fodder
- ✔ Spent $2.7million to build a new dairy

By **Jeanette Severs**

VAN Dairy Group acting general manager Hugo Avery says herd size is expected to increase at The Gums to up to 1400 cows with the 60-bail rotary dairy now operating. Photo: Johanna Baker

SPENDING $2.7million to build a new dairy is part of a rolling upgrade and improvement plan for VAN Dairy Group, located at Cape Grim, Tasmania. Improving infrastructure is among a suite of management objectives to increase production and efficiencies among the 25 dairy farms on the 19,000-hectare Woolnorth Station.

Upgrade works began in 2010 under the previous ownership — the investment arm of New Plymouth District Council — and continue under the new proprietor, previously Moon Lake Investments, now known as VAN Dairy Group.

"The previous builds have been very time constrained," acting general manager Hugo Avery said. "We didn't want to be time constrained with this one."

'This one' refers to The Gums, the only 100 per cent spring-calving dairy on Woolnorth. The farm receives significant winter rainfall and the dairy sits on low land, as much of the Woolnorth property does.

The first decisions to be made were about whether to do a new build or a rebuild. Mr Avery said it was an obvious decision to go for a new build.

"We get a lot of coastal weather, an environment that is quite harsh and rusts galvanised steel," he said.

"This dairy was all gal steel. A new build would also make the dairy more central on Woolnorth.

"It was a major part of why the old 50-bail rotary dairy was replaced," he said. "The Gums is one of a number of dairies nearly past their use-by date. It's also a very wet property during winter, so we took some of the dry herd off for six weeks to alleviate pasture pressure."

Choosing a greenfield site enabled Woolnorth to bring 75 hectares into operation that were not previously part of a dairy farm. The greenfield site meant the new dairy platform could be built without needing to compromise the existing dairy nor interfere with work practice in its shed.

The $2.7 million cost included a 60-bail rotary dairy, three new silos, new effluent management infrastructure, tanks for washdown, constructing the entrance and exit laneways and yards, as well as an onsite cattle crush and an integrated automated dairy system.

The new shed and dairy build began in November last year. "We re-used as much of the previous plant as possible on other farms," Mr Avery said.

A cattle crush, stockyards and automatic gates were incorporated in the build, to enable seamless workflow among the cows. Photo: Johanna Baker

Automatic cup removers, weighing, drafting and herd identification are all part of the dairy automation system. Photo: Johanna Baker

Milking equipment was manufactured in stainless steel by DaviesWay at Warragul, Victoria, and transported to The Gums to be installed. Photo: DaviesWay

Woolnorth's project manager Ben Davis managed the overall construction and liaised with tenderers and tradespeople and made the job relatively straightforward.

"It's now 80 days since commissioning, and the herd was calved down at the new dairy," Mr Avery said.

From milking 1030 cows and producing 446,744 kilograms milk solids in the 2017 calendar year, The Gums is on track to produce the budgeted 471,538kg MS from 1050 cows this year.

The new platform is operable by one person, but Mr Avery said the herd is milked as two herds, as part of a company occupational health and safety policy. "It's a one-person milking platform, but we try to change the milker part-way," he said. "It saves people's hands from getting strain injuries.

"It can be up to two people in the dairy at once. One might be an AI technician and another is milking."

Herd size is expected to increase at The Gums as the additional 75ha improves and boundary realignments occur to enable better pasture management and cow flow.

Mr Avery said The Gums had the potential to grow to a milking herd of 1400 cows.

Building the new dairy

The tender for constructing the new dairy was awarded to DaviesWay, Warragul, Victoria. Mr Avery said the service capabilities of the organisation providing the plant and price was critical in choosing the successful tenderer.

"We looked at what technical support they could offer us," he said. "We also looked at what was working already for us. We wanted to recruit technologies that potentially could be used on our other farms."

That technology included herd-management software, automatic-drafting gates and the potential ability to record cell count testing, fat and protein.

DaviesWay project manager Nico Polato said DaviesWay assumed responsibility for the entire project, which excluded the new effluent system. While the client — VAN Dairy Group — had a clear idea of what the new dairy should incorporate, there was room for collaboration. "We suggested the Halo monitoring system and they were receptive," Mr Polato said.

Developed in New Zealand, the Halo system monitors the milk along the line and into the vat and enables the farm manager to receive SMS alerts remotely. "For example, the farm manager receives an SMS if the line is not connected to the vat," Mr Polato said.

"The system monitors if the milk vat is turned off when it should be turned on and it's able to measure the milk volume for each cow."

Mr Avery said the Halo system, networked into Woolnorth's business management technology, enabled workflow in the dairy to be monitored remotely.

It was one of only a few items of the build that were not either constructed in Tasmania or on mainland Australia. Mr Polato said most labour and trade skills contracted to the build were recruited within Tasmania.

The entire project was managed and tracked through a Gantt chart, which ▶

DaviesWay project manager Nico Polato says DaviesWay assumed responsibility for the entire project. Photo: DaviesWay

A building with farm office, showers and a bathroom was also constructed within the shed. Photo: DaviesWay

The 2.4m high panel walls and the shed were assembled on site by Bison, using cranes. Photo: DaviesWay

Mr Polato said ensured the entire team — owners, managers and contractors — were informed and collaborating on the timing of work throughout the five-month build. "The project was delivered on time and on budget," he said.

A geological study and soil compaction tests were undertaken before earthworks. A quarry on Woolnorth provided soil for earthworks on The Gums site. "We moved about 7000 cubic metres of soil onto The Gums for the new dairy and to construct laneways," Mr Polato said.

Footings were poured as part of site preparation. The superstructure of the dairy shed was manufactured by Bison Constructions, Scottsdale, Tasmania. The shed stands four metres high underneath the gutter, and all the frame, wall panels and roof are hot-dipped galvanised steel, to offset the influence of coastal air.

Concrete tilt panel walls were also manufactured by Bison. The 2.4m high panel walls and the shed were assembled onsite by Bison, using cranes.

As well as the dairy platform, a building with farm office, showers and a bathroom was also constructed within the shed.

A heavy 60-bail rotary milking platform was manufactured by Yarroweyah Engineering, Yarroweyah, Victoria, and assembled on site at The Gums.

'It was an obvious decision to go for a new build.'

Yarroweyah Engineering operations manager Adam Hargreaves said the deck was packed as a kit and shipped to Tasmania. The firm had already installed similar platforms at other Woolnorth dairies.

"This design also works with gear that DaviesWay use," Mr Hargreaves said. "We make everything at Yarroweyah in kit form, acid clean and wash it, then load it into a carrier to transport."

Assembly was in two parts. The hot-dipped galvanised steel undercarriage was assembled, the bails erected and the cement poured to hold everything secure. After curing, the stainless steel upper deck was assembled across a second week of work.

"That's when the milk equipment fittings occur, then it's finished off with the entrance and exit gates and backing kick rails," Mr Hargreaves said.

A cattle crush, stockyards and automatic gates were incorporated in the build to enable seamless workflow among the cows.

Milking equipment was manufactured in stainless steel by DaviesWay at Warragul, Victoria, and transported to The Gums to be installed. "We provided milk harvesting equipment, a fully automated feeding system and dairy automation systems that were 75 per cent Australian built," Mr Polato said. "Some supporting components were manufactured in Europe and North America."

Automatic cup removers, weighing, drafting and herd identification are all part of the dairy automation system. The feed system enables lead feeding as well as three different feed types to be apportioned.

"The plant is engineered to operate 22 hours a day, if needed, milking 1200 cows," Mr Polato said.

DaviesWay designed a unique system to enable veterinarians and artificial insemination technicians to safely interact with the cows during milking. "It's a system we've developed for other dairies and we've installed on another Woolnorth farm," Mr Polato said. "A permanent veterinary stand was included on the exit race platform and winch-operated platforms operate at each gate."

A glycol system was installed to cool the milk and pre-heat water for the dairy.

Three, 53 cubic metre steel silos were erected for storing grain and pellets.

Local contractors installed the effluent spreading system. Mr Avery said the effluent tank was manufactured in New Zealand. "The effluent goes through a sump with a vibrating screen to get rid of solids," he said.

"The green water is utilised for washdown and surplus water is used to irrigate 100 hectares through a travelling irrigator."

DaviesWay staff led the post-construction familiarisation. "After the dairy was commissioned, we trained the management and staff in how to use the equipment and assisted at six milkings to ensure the system works for the cows and the operators," Mr Polato said.

DaviesWay provided manuals and laminated wall charts detailing standard operating procedures.

VAN Dairy Group overview

VAN Dairy Group's Woolnorth Station has 25 dairy farms, with supporting cropping land, on a 19,000-hectare property. Twenty-one farms are operated by managers, two are sharefarmed and two are leased out. One additional property is used for rearing heifers and another grows fodder for the dairies as well as wintering spring calving cows when they are dry. Twenty-two of the farms are dryland.

Three of the farms are converting to Australian organic accreditation status.

Nine farms are spring calving, five farms are split calving and eight farms are autumn calving. "There are more autumn-calving farms because of the coastal climate and the calving period is based on pasture growth," acting general manager Hugo Avery said.

About 19,000 milkers produce 430kg milk solids per cow annually. The strategy is to grow the business to 20,000 milking cows, by growing more pasture and fodder.

One of the tools they use is the considerable history of weather data collected at the Bureau of Meteorology weather station at Cape Grim. "Knowing the historical weather data of the farm helps us to predict opportunities for pasture and forage crop growth," Mr Avery said.

Growth in the herd's size and milk-production capacity is being replicated across Woolnorth with a range of strategies — improving management and farm operator skills, pasture improvement, realigning boundaries and paddocks to be more productive and investing in genetics.

The breeding program is an intense program for cows, heifers and staff, Mr Avery said. "We use bulls that have traits that we want — easy calving, high fertility, good feet, sound udders in their cow families, good BPI (Balanced Performance Index)," he said.

Replacement two-year-old heifers are synchronised once and mated to artificially inseminated (AI) Jersey semen to encourage an easy calving. About 60 per cent of the heifers achieve a positive AI joining. Mop-up bulls are put in with the remaining 40 per cent for eight weeks.

"Progeny from the AI mating are reared as the genetic merit on average should be higher than the older cows," Mr Avery said. "We get around 95 per cent in-calf rate in the heifers overall."

Conventional cows are vet-checked about a month before AI begins to ensure no underlying metritis. Heat detection stickers are attached to identify cows that are not cycling.

"The non-cycles are treated and Cue-mates inserted, so they are joined to AI semen on day one of mating," Mr Avery said.

"Cows that calve after 30 days prior to mating are tail painted a different colour; any of these cows not mated after three weeks of AI are treated as non-cyclers.

"The main part of the herd that are cycling cows are put through a five-day 'why wait' program."

Most cows are joined within 10 days of the start of mating.

The main herd cows are joined to Holstein semen with criteria of easy calving, high fertility, good feet, sound udders in their cow families and good BPI. "Any cows the farm managers don't want to keep replacements from are mated to AI Hereford semen, so their calves are not reared," Mr Avery said.

"Bulls are not used because of work health and safety risks to staff and they are very expensive to keep. They also dig holes in our very sandy soils. We have found that using only AI gives about the same overall in-calf rates."

The only real negative is that staff can get a bit tired towards the end of mating. This is especially on the split-calving farms where mating takes up 20 weeks of the year.

"This intense mating program results in a very intense calving," Mr Avery said. "We get to mid-point in calving by day 12, so there is not much sleep for staff, especially those responsible for herds of 1000 cows. But the calving gets over and done with quickly."

Such an intense mating and calving program enabled heifer replacements to be quite even in size.

About 4100 autumn calves and 2500 spring calves are reared each year. All calves are regularly weighed from three weeks after birth. Each calving period results in two intakes to the Heifer Rearing Unit.

Calves are sent to the heifer unit at a minimum 100 kilograms, usually 15 to 20 weeks old, weighed and drafted into mobs of about 200 head, with similar size cohorts. Heifers return to the dairy farm at 23 months old and ready to calve. "To run this unit effectively, the more even each line is the easier it is to manage," Mr Avery said.

There are 147 employees in the business, including farm managers and workers, group operations managers (with several farms under their oversight), office staff and field technicians.

All farm operators meet with management three-monthly, and field days are held regularly for all staff to attend and learn skills and improve knowledge. "We have a formal skills training requirement and offer lots of short courses," Mr Avery said.

"All full-time staff are encouraged to study agriculture through the certificates to diploma level. We also have a two-way feedback mechanism and if a staff member suggests a course we haven't already backed nor are offering, we take that suggestion on board."

Education and training are emphasised for the positive impact on production.

"We encourage improving management skills of farm operators and workers, year on year," Mr Avery said.

Woolnorth uses independent veterinarians and agronomists and contractors for dedicated fencing, cultivation, sowing and harvesting work.

"We sow forage crops on about 10 per cent of each farm annually, so we contract that work, utilising their skills and capital equipment," Mr Avery said. "The vast majority of fodder is made on the farm."

A technician is employed whose role is to manage and record pasture growth and monitor feed wedges across all farms.

All grain and pellets are bought in, as is hay if the season requires it.

—Jeanette Severs

Open-heart surgery was just what the doctor ordered

A Gippsland dairy family saved $700,000 by choosing to renovate its 50-stand rotary instead of re-building from scratch.

Patriarchs Wayne and Joan Weller, together with son Dale milk up to 1300 cows on two farms at Longwarry, 84km east of Melbourne. By making intelligent use of their existing infrastructure, they have made some "**night and day**" improvements to one of their dairies without breaking the bank.

It includes giving bigger cows additional room in the bail, addressing the jetter positions and overhauling its milking plant.

The dairy was finished in July 2018, and two months later the family calved down more than 700 cows in two weeks – including 200 two-year-olds.

The upgrades were led by installing a new Yarroweyah Engineering rotary platform. The revamped milking plant detail included a Guardian II auto wash system, a lowline milking system with a Variable Speed milk pump, a jumbo milk filter, industrial plate cooler, Tech-line visi claws, Milkrite shells and triangular liners (including Milkrite Interpulse high-line pulsation, milk yield information, cow retention, a Teatwand exact auto sprayer, a cow motivator and cow locators).

The Wellers chose Australian company Daviesway to customise their package.

"**The infrastructure was all here,**" Dale said. "**The vat was still standing, the shed's structural integrity and yards were still ok. But the platform was a big issue**".

"**After-all, the dairy was 27 years old, it was rusting out and we were always dealing with breakages and it didn't help that we were always struggling to access spare parts.**"

The proudly cost-conscious family knew exactly what it needed.

"**The new platform has made it a lot more comfortable for the cows,**" Dale said.

"**The new cups are much lighter than our old machines,**" Wayne adds. "**Our staff are really enjoying that, because they are so much easier to put on. And, we haven't had one cup slip off a heifer. Cup-slip was a big issue in the old shed, and we still have the same vacuum pump, so we know there has been a massive improvement in that area.**"

Wash-down is also no longer a chore.

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IRDBF

MARCH 2019

Australia

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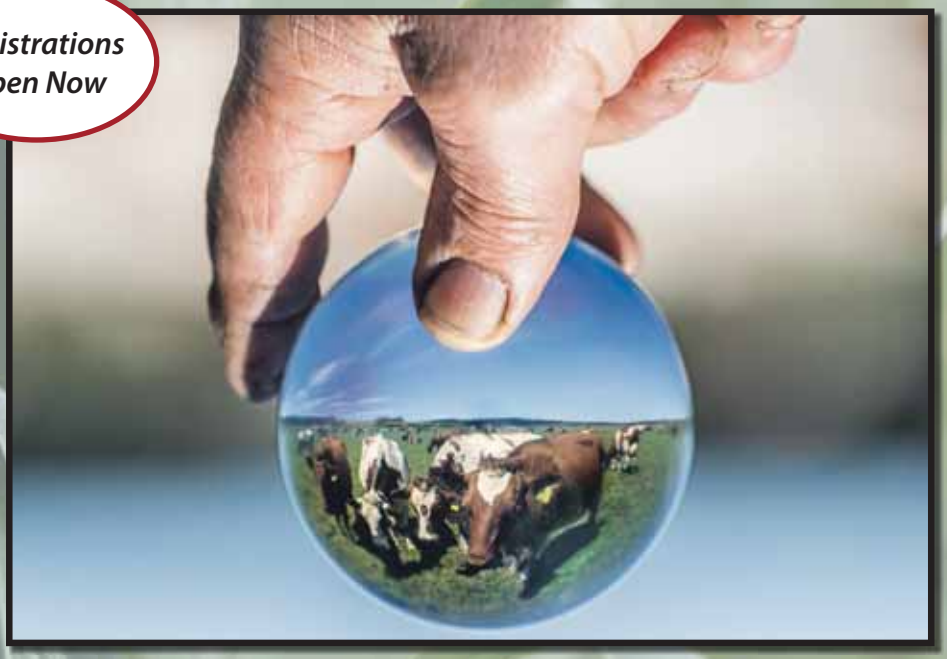

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Key points

- ✔ What: International Red Dairy Breeders Federation conference
- ✔ When: March 22-29
- ✔ Where: South Australia and Victoria

Graeme Hamilton's outstanding red dairy herd will be part of the farm visits for the conference. Picture by Michele Hamilton.

THE International Red Dairy Breeders Federation conference will be held in Australia in March. The event, which is being hosted by Australian Reds — The Australia Red Dairy Breed Register, will feature an extensive tour of South Australia and Victoria.

Red breeders from around the world will have the opportunity to visit up to 13 farms, as well as take part in a conference featuring a great line up of Australian and international speakers.

The main event runs March 22-29 with an optional tour to Gippsland to run March 29-31.

The conference section of the event will be held at the unique rural function centre 'The Barn' near Mount Gambier, SA, and will consist of a meeting day with keynote speakers, an unusual photography competition, herd visits, and various social and sightseeing activities. The post-conference tour departs Mount Gambier for the famous Great Ocean Road for more herd visits and fabulous scenery.

A highlight of this section will be a comprehensive tour of Genetics Australia's artificial breeding facility at Bacchus Marsh, Vic.

Farm visits

The event will include visits to some of Australia's leading red herds. These include:

- The Waikato herd of Michael Green, Mount Schank, SA. Mr Green's herd of 650 milking cows, of which 300 head are pure red, produces 6 million litres and 430,000 kilograms of milk solids per year on a milking area of 167 hectares, all of which is irrigated.
- Graeme and Michele Hamilton, Hamilton's Run, OB Flat, run a 4 million litre ▶

First conference held in Norway

THE International Red Dairy Breeders Federation held its inaugural meeting and conference in June 2016 at Hamar Norway, hosted by Geno.

Forty-six delegates from 17 countries gathered for this important occasion. A set of guidelines for objectives, structure, management, and member responsibilities was adopted.

A governing board of five members was established, three from Europe and two from the rest of the world. The board's first task was to establish a Constitution for the federation, financial matters, social media presence, and membership base.

Official speakers at the conference presented information about genomic selection and statistical performance of the Norwegian Red Cow; crossbreeding also featured. Another topic of discussion was improving the extender used in frozen semen storage.

An interesting segment was economic and welfare challenges of dairy farming. Another segment analysed worldwide cost of milk production.

A most interesting presentation on the work being done on feed use efficiency was also given, and was labelled the next big issue to follow health traits in dairy cow breeding.

The conference was largely held in the regional city of Hamar on Lake Mjosa. The tours continued by road to Trondheim on the west coast of Norway, for some additional farm visits, and cultural experiences.

◀ intensive grazing operation. Breeding efficient red dairy cows has been a part of their operation since 1964. The Hamiltons place strong selection pressure on fertility and production performance, which has delivered attractive cows yielding high margins over feed costs.

• Scott Braendler and his sister Cheryl Liebich are well known and successful Ayrshire breeders who recently had the distinction of winning the 18-to-24-months of age class of the Ayrshire World Photographic Competition. Their Boldview Farms Cher-Bar Ayrshires now operates at a new location at Mount McIntyre on the Limestone Coast of South Australia.

• Warren Doecke, with his wife Cheryl and son Damien, leads a successful family farming team near Murray Bridge, calving about 400 cows per year. They have been pursuing biodynamic farming methods since 2006.

• Blackwood Park, the Australian Red Dairy Breed herd of Jan Raleigh, Timboon, Victoria. Her cows have been

Successful Ayrshire breeder Scott Braendler and his sister Cheryl Liebich now operate from a new farm at Mount McIntyre, which will feature in the conference. Picture by Michele Hamilton.

Australian Red Dairy Breed's social media icon on Facebook and Twitter for some time. After 30 years of breeding Australian Reds she considers the herd's good temperament as one of the best characteristics achieved.

• David Kuhl, Braelee Pastoral, runs a thriving Illawarra herd and an extensive sheep grazing operation .

General interest tours

The event will also feature a number of general interest tours.

These include:

• Genetics Australia's Parwan Park bull collection centre at Bacchus Marsh, Victoria.

• A tour of the beautiful rural area of the Barossa Valley, north east of Adelaide. This will include some of the filming locations for the successful television series McLeod's Daughters.

• A meal break near the iconic Twelve Apostles along the Great Ocean Road, Victoria.

• Kilsby Sinkhole, an amazing natural wonder with a unique and fascinating history. The sinkhole has been used for weapons research testing and diver training, and is now an emerging tourist icon of the Limestone Coast of South Australia. D

Contact: Event organiser Kylie Boston, email <kylie.smc@bigpond.com>, 0407 231 547, website <www.irdbf2019.com.au>.

Youth scholarships offered

THE Australian Red Dairy Breed Register (ARDB) is offering three scholarships for young people to attend the International Red Dairy Breeds Federation conference, free of registration fees.

The event runs from March 22 to 29.

The scholarships aim to develop and enhance young farmers in their understanding and participation in red dairy breeds. The scholarships provide financial assistance to the value of $880 per awarded place to cover registration fees for the conference in Australia. (Travel to and from the conference, and accommodation during the conference is not covered in this scholarship.)

To be eligible for the scholarship:

• Applicants must be aged 18-35 years old.

• Applicants must be engaged in farming as an owner, manager, sharefarmer, or employee in a red dairy farming enterprise or crossbreeding with reds.

• Applicants must have the ability to take the time off work to attend the conference.

On completion of the project the successful applicants will be expected to share their learning with the Australian Red Dairy Breed organisation. This will require a short written report on the value of the IRDBF Conference to be completed within six weeks of attending.

Applications must be received by November 30.

For more information and to download an application form visit the conference website <www.irdbf2019.com.au//library>.

Conference itinerary at a glance

Thursday, March 21 — Arrival day ready for an early start on Friday

Delegates should arrive in Adelaide and stay overnight at Stamford Grand Hotel a beachside suburb of Glenelg, SA.

Friday, March 22 — Event officially begins

A networking breakfast at the Stamford Grand Hotel is followed by a tour to the iconic Barossa Valley, taking in some breathtaking scenery, and some of the filming locations of television series McLeod's Daughters. Overnight at Novotel Barossa, Rowland Flat.

Saturday, March 23

Travel to the Lower Murray and Lakes district. Visit biodynamic farm Springvale Illawarras, run by Warren, Cheryl and Damien Doecke. Overnight at Rydges Pit Lane Hotel at Tailem Bend, SA.

Sunday, March 24

An early start with a visit to the well-known Treeton Illawarra herd of Geoff and Rosemarie Williams, Meningie, SA, then travel through to the Limestone Coast. En route visit the newly located farm of Boldview Farms Cher-Bar Ayrshires, owned by the Braendler and Liebich families, Mount McIntyre, SA. overnight at The Barn, an outstanding conference and entertainment venue, south of Mount Gambier, SA.

Monday, March 25

Local tours including a visit to the very interesting Kilsby Sinkhole. Along with sightseeing, visit three dairy farm: Michael Green's Waikato Farm Australian Reds, Mount Schank, SA; James and Robyn Mann at Donovan's Dairy, Wye, SA, and Braelee Illawarras, near Tarpeena, SA, owned by David Kuhl and family, who run a sheep farm as well as their dairy herd.

Tuesday, March 26

Official conference day, which will explore the theme of Bringing Red Breeds Together. There is a great line up of Australian and international speakers. Featuring updates from around the world on present and future breeding aspects of the red breed. New information on feed efficiency and heat tolerance trait, and a focus on managing breed diversity.

Wednesday, March 27

Presentation by local vet Dr Andrew Hoare and Dairy Australia will explore the economics of a successful red dairy farm operation. Then visit Hamilton's Run Australian Reds owned by Graeme and Michele Hamilton, OB Flat, SA. In the afternoon the formal International Red Dairy Breeds Federation business meeting will be held. There will also be a meeting for the European Red Dairy Breed members. A Poster Night showcasing red dairy breeds from around the world. A special photo competition from Australian Reds will be conducted by an overjudge and by popular choice as well.

Thursday, March 28

Travel along sections of the Great Ocean Road, including The Twelve Apostles. Visit the farms of Brett and Bronwyn Davies, Barleydew Australian Reds, Cooriemungle, Vic, and Jan Raleigh, Blackwood Park Australian Reds, Timboon, Vic. Overnight in Geelong at Rydges.

Friday, March 29

Last day of the main tour features a visit to platinum sponsor Genetics Australia at their property Parwan Park, Bacchus Marsh, Vic. Departure to Melbourne Airport or optional post-event tour to Gippsland

Optional post-event tour to Gippsland
Friday, March 29-Sunday, March 30

Includes four farm visits and an overnight stay at San Remo with an evening tour available to nearby Phillip Island to see the Little Penguins.

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Llandovery Ja-Bob Stella 822 EX93
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ILLAWARRA DEVELOPMENT PROGRAM CONTACTS:

Michael Tuhan (Vic) 0419 377 098
Warren Doecke (SA) 0417 804 633
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High-quality speakers for event

Key points

- ✔ Conference day to be held Tuesday, March 26
- ✔ Theme Bringing Red Breeds Together
- ✔ Features range of Australian and international speakers

THE International Red Dairy Breeders Federation official conference day on Tuesday, March 26, will explore the theme of Bringing Red Breeds Together. It will feature a great line up of Australian and international speakers.

Speakers include:

• Joint Masters of Ceremonies are Erik Thompson, of Viking Genetics Australia, and Anthony Shelly, of Genetics Australia.

• Michael Harvey, Rabobank Australia, senior analyst — dairy, is an enthusiastic and experienced dairy analyst, based in Melbourne. He has been actively involved in the Australian dairy industry for much of his life, having been raised on a dairy farm in the northern Victorian irrigation district. He brings to this role more than 15 years of experience as a professional analyst, researcher and adviser gained through working with Dairy Australia (the peak industry body) as part of the trade and strategy team before joining the RaboResearch team in 2011. Mr Harvey has an in-depth knowledge of local and global dairy markets and how dairy supply chains function.

• Dr Andrew Hoare (BVSc) is a practice partner of South East Vets, Mount Gambier, SA. he grew up on a beef cattle property in southern Queensland, but has found his way south and into dairy cattle work. He has been president of the Australian Cattle Veterinarians, is currently the South Australian representative for Australian Cattle Veterinarians, and is also on the National Cattle Pregnancy Diagnosis Committee. Dr Hoare is passionate about helping other veterinarians develop their skills in ultrasound pregnancy diagnosis and is currently an accredited manual and ultrasound pregnancy tester and examiner.

• Christina Paulsen-Schluter, of Germany. Ms Paulsen-Schluter grew up as a suburban city girl. her grandfather was an Angler breeder and she spent all her holidays on the family farm. From a very young age, her highest interest was dairy farming and breeding Angler cows. After completing high school, Ms Paulsen-Schluter spent some years studying for a Master's Degree in Housekeeping, an agricultural apprenticeship, and a Bachelor of Agriculture before taking over the family farm in Tolk, Angeln, Germany. Since 2001 she has been active in various leadership roles, including the Angler Breeding Committee, board member for RSHeG (cattle breeding co-operative for all breeds in Schleswig-Holstein), member of supervisory boards for other companies, and a member of umbrella organisations for red dairy breeds. ►

• Dr Jennie Pryce, BSc Hons, PhD (Genetics) University of Edinburgh, is principal research scientist of Agriculture Victoria and La Trobe University, located at AgriBio, where she leads a large team of scientists and supervises PhD students. Her main areas of interest are genetic improvement of functional traits in dairy cattle, optimising breeding scheme design under genomic selection, and development of dairy selection indices. She is lead scientist of DataGene and also sits on several industry and research alignment groups that shape the future of dairy research in Australia. Ms Pryce is also a member of the ICAR (International Committee on Animal Recording) working group on functional traits. Previously, she was employed by the Scottish Agricultural College, and Livestock Improvement Corporation in New Zealand.

• Peter Williams, B Ag Sc. After completing his Bachelor of Agricultural Science Mr Williams started work in the dairy industry at VAB/Genetics Australia based at Bacchus Marsh, Victoria, and spent 13 years working in the area of progeny test and sire procurement. This involved the selection and importation of the first ever live bulls and embryos from North America. Following on from this he worked another 12 years managing the sire acquisition and progeny testing at RAB Albury and ABS Australia. Mr Williams joined DataGene as an extension officer after its formation in 2016, following on from his appointment at the former Australian Dairy Herd Improvement Scheme in 2011. He has many years experience in the artificial breeding industry where he was responsible for selecting and proving some of Australia's most popular and influential sires.

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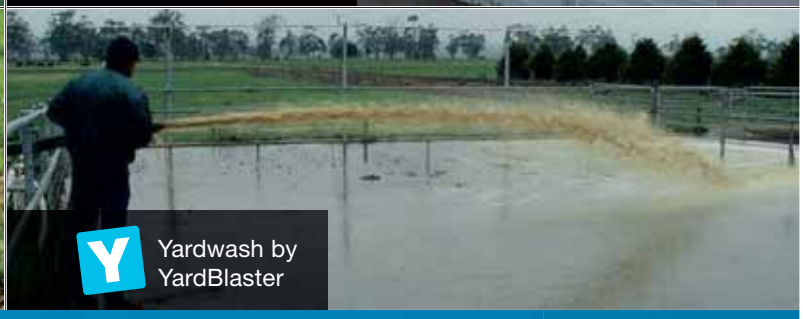

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Nitrogen-fixing plasma reactor trial

Key points

- ✔ Trial to make fertiliser from manure, air and renewable energy
- ✔ Aim to cut ammonia losses on farm
- ✔ Makes more nitrogen available to plants

By **Chris McCullough**

A LARGE dairy farm in Northern Ireland is trialling a new system of reducing ammonia emissions while producing its own liquid nitrogen fertiliser.

This new concept, developed by Norwegian company N2 Agri, involves passing manure or digestate through a plasma reactor to produce the liquid nitrogen fertiliser.

This process, says the company, will ultimately save farmers up to 20 per cent of their artificial fertiliser costs and also reduce their ammonia production levels.

Although the concept has moved beyond the prototype stage, it is still being tested around the world: on a pig farm in Denmark and on a 650-cow dairy farm near Templepatrick in Northern Ireland.

'The plasma reactor was installed at the farm five months ago on a trial and is already producing liquid nitrogen.'

The dairy farm is run by Robin Bingham and his son George, who installed a biogas plant one year ago, which produces electricity and supplies it into the national grid.

In total, the farm has 1200 cows, including dry cows and followers, and runs a zero-grazing system where the fresh grass is harvested and delivered to the cows daily.

The plasma reactor was installed at the farm five months ago on a trial and is already producing liquid nitrogen, which has been spread on test plots at the farm.

N2 Agri said its goal was to fundamentally improve the global food production by enabling farmers to produce their own fertiliser from manure, air and renewable energy. By installing their system, N2 Agri said farmers could potentially save up to 20 per cent on their artificial nitrogen costs and with these savings should be able to pay back the plasma reactor in about six or seven years.

With expertise gained in the fertiliser industry over many years, the experts at N2 Agri have developed and patented this technology that uses a plasma reactor that fixes nitrogen from the air and adds it to the manure.

This causes a reaction with the manure and stops ammonia losses as well as emissions of other greenhouse gasses, and removes bad odour.

Besides reduction of ammonia emissions, the system increases the nitrogen content in the manure and ▶

The Bingham farm has 1200 cows and runs a zero-grazing system.

The digestate from the biogas plant is processed in N2 - Applied's containerised plasma reactor.

Digestate from the biogas plant is converted into liquid nitrogen fertiliser.

The process reduces ammonia emissions significantly.

The process turns the digestate into high-value liquid nitrogen fertiliser.

transforms it from a waste product into a high-value fertiliser.

N2 Agri business development director Henk Aarts, said: "Our objective is to empower livestock farmers through the introduction of a low-cost, scalable fertiliser production on the farms.

"Our ultimate goal is to substitute chemical fertilisers with fertiliser produced locally on the farm from air and renewable energy. And meanwhile, we work on a better stable climate and a more sustainable livestock sector.

"We can also upgrade biogas digestate to a higher value fertiliser with our technology."

Although the company is trialling two machines in Europe, it has plans to embark on more trials further afield in places such as South Africa.

N2 Agri is partnering with SBI, an innovative plasma welding company based in Hollarunn, Austria. N2 and SBI are further using the competence of the University of Vienna for analysis of plasma composition and temperatures.

Mr Aarts said: "We are not in the phase of selling machines yet, but want to show our plasma reactor and explain the working principles to the stakeholders.

"Our reactor is not fully developed, but we want to test it under farm conditions in an early stage to get experience with different types of manure and biogas digestate and to do field trials on different crops, which on the Bingham farm are grass plots."

The key argument to convince farmers to use this plasma reactor is to explain how they are losing so much nitrogen from their livestock and slurry, which is later supplemented by artificial fertiliser spread on the ground.

In fact, there is 2.13 million tonnes of ammonia lost on European livestock farms each year, which is a huge loss of potential fertiliser.

One of the founders of N2 Agri is Norwegian Rune Ingels, a chemical

engineer who spent almost 30 years working in the fertiliser industry, more recently with Yara, before resigning to embark on his own ideas.

Mr Ingels explained how farmers lose nitrogen and were then forced to pay out for expensive artificial fertiliser.

"We need above 95 per cent moisture content in the manure to make the system work," he said. "Slurry has 50 per cent free ammonia but digestate has around 70 per cent free ammonia. Just over 50 per cent of the total nitrogen available in slurry is lost before it can be spread on the ground. However, using our system we can make more nitrogen available for plants, which are also taken up quicker by the plants increasing their growing rates and yields.

"There are some tweaks needed to the system the Binghams are using as it is primarily installed to test yields at the moment."

Dairy farmer George Bingham said the system interested him as it met his desire to farm in a more environmentally friendly way.

"Using this plasma reactor system will help us achieve our goals of farming more environmentally friendly while at the same time, sorting out my ammonia quotas," Mr Bingham said.

"I see this as a potential game changer across the world helping farmers get more from their farmyard slurry and saving them money.

"For me, reducing or even eliminating my chemical fertiliser bill is one of the main benefits of this system.

"The system has only been installed one month and we have already produced our own liquid nitrogen and spread it on some grass test plots to see if the theories of faster plant growth with higher yields are feasible."

It is anticipated that a farm with 150 to 200 cows would need one 25-kiloWatt plasma reactor, so a 600-cow herd would need three units.

Mr Aarts said the reactors could be scaled to suit the farm.

"We can change the sizes of the reactor to suit the herd," he said. "We don't have exact prices as yet but I can tell you a reactor is cheaper than a milking robot and is the same size as one." D

For more information, go to website <http://fusionfarming.com/>.

The plasma reactor uses only air and power from the biogas plant.

Rune Ingels, George Bingham and Henk Aarts at the Bingham farm in Northern Ireland where a new plasma reactor is being trialled.

Effluent plan key part of dairy upgrade

Key points

- ✔ New 100-unit rotary dairy built
- ✔ Two-pond effluent system constructed
- ✔ Water can be recycled into farm's irrigation channel

By **Keith den Houting**

THE floodplain around Kerang and Swan Hill in north-west Victoria is dotted with depressions and surrounding windblown lunettes. Some of these depressions are quite extensive and are filled with water via flooding of the rivers that converge into this region. Others are used by Goulburn Murray Water for irrigation water storage purposes. Lake Boga is one of these.

Paul and Sally Bethune, principals of Lake Boga Pastoral, run their dairy farm between this lake and the Murray River at Winlaton about 10 kilometres from Swan Hill, with the Little Murray being the northern boundary of their 800-hectare dairy property.

Sally and Paul Bethune have made several infrastructure upgrades to their property, included a 100-unit rotary dairy.

The Bethunes milk about 950 cows, calving twice a year on two farms with the farms growing only annual pastures. The surplus from spring growth is conserved as silage and hay.

The hotter drier months are catered for with a feedpad and silage/hay mix with a grains ration in the bail. Mr Bethune said that they provide and mill their own grain and the additives are supplied by Franklin Grains.

Their property also contains lunettes and the bulk of the grass is grown in the basin between these, with irrigation water pumped on to the flat area of that basin from the Little Murray.

The property consists of district farms amalgamated since 1946 with Mr Bethune's grandfather and father preceding him to get to this existing set up.

One of those properties provided the couple with a pipe-and-riser irrigation system, while the rest is open channels and gravity irrigation and reuse systems.

The Bethunes have five young boys and are consolidating and customising the property into the set up that will be of greatest benefit into the future. Mrs Bethune said: "We have not reached our sweet spot with cow numbers and this will eventually show itself".

The cows are milked in a 100-unit rotary, which was completed last January and is built on one of the high spots on the farm. The reason for the new shed is that the milking time in the previous herringbone took up to four hours. This was deemed not sus-

The milking platform has a fall to the front of the cows with a spoon drain and drainage via 100mm pipe.

The first pond has a beautiful crust of manure covering it and drains into the second pond.

tainable so the plans came about to go rotary.

Mr Bethune said he admitted it was a success, although he said he had not been a strong advocate for rotary dairies at first.

The herd is a mix of Holstein and Jersey and crossbreds and is artificially bred to Holstein, Jersey and Angus. The use of sexed semen is extensive and quite successful with Nugenes providing the service.

All the heifer and beef calves are reared with dairy bulls sold as bobby calves. The calf-rearing area is a kilometre way with good yards and shelter provided.

'Another feature of the structure is the double fencing around the ponds.'

There is some leased land included in the business as well as cattle and replacements on agistment. Another dairy farm is leased near Kerang, about 50km away.

There are two 250,000-litre water tanks on site with one for dairy and fire emergency and one for rainwater storage.

Mr Bethune said when the new dairy was being planned, the management of effluent and its use on farm was an important consideration. The site of the farm on a flood plain increased the importance of drainage and effluent disposal.

The milking platform has a fall to the front of the cows with a spoon drain and drainage via 100-millimetre pipe at every six cow placings to a drain at the operator's feet all around the platform skirting.

From there all liquid goes via a 300mm underground pipe to the pond. The yards and shed are all washed down with strategically placed Yard Blasters.

The excavated dirt from the effluent ponds was used for the base of the dairy building. The site overlooks most of the property and raising the building site even higher was important on the floodplain.

The excavation created two sizable partly above-ground dams. "When we started, we just kept digging to raise the building site to a greater height and that's how we got to the size of the ponds," Mr Bethune said.

The ponds are close to 75 metres long. The second (aerobic) pond is estimated to hold 8 megalitres of liquid. The first (anaerobic) pond is slightly narrower but equal in length. This has a beautiful crust of seemingly solid manure material covering it and a 300mm pipe with a T-section allows liquid from under the crust to overflow into the second pond.

This second pond has another 300mm overflow pipe to the farm irrigation channel. Although the shed had been operational since January (nine months at the time of writing) ►

A fixed tractor-driven pump on the second pond is used to pump liquid to the farm irrigation channel.

Liquid from the first pond drains into the second pond via a 300mm pipe.

◀ the liquid level had not yet reached that pipe and is in fact still at least a metre below.

The feature of this pond is its size but also a fixed tractor-driven pump that can and will be used to pump liquid to the farm irrigation channel.

Mr Bethune said intimated they would soon use this pump as the opportunity to do so and mix effluent with irrigation water will soon be gone as irrigation ceases for this season.

He said they were not willing to allow the liquid levels to rise too high and was keen to use the pump.

Another feature of the structure is the double fencing around the ponds. The outer fence is three electric wire and the inner is 750mm apart and seven wires permanent fenced. This safety factor is impressive as many an animal has mistakenly thought the anaerobic pond crust to be solid and capable of bearing weight.

"We got a good amount of assistance of planning our effluent from Scott McDonald from Echuca Agriculture Victoria and he knows more about effluent than anyone I know," Mr Bethune said. He was invaluable gaining the necessary permits.

The farm and business employs 10 full, part time and casual labour units with most employees having been with the company for five-plus years.

Mr Bethune was born and bred on

Two 250,000-litre water tanks are on the site with one for dairy and fire emergency and one for rainwater storage.

The farm and business employs 10 full, part time and casual labour units with most employees having been with the company for five-plus years.

the farm and is a Dookie graduate, with Mrs Bethune originally from Yarram, Vic, but not from a dairying background. She said when she first arrived she asked herself why people would farm up here but has grown into the role and the region and is enthusiastic about the future.

The Bethunes Sally have some plans to add to their infrastructure to do some dairy manufacturing and value adding of their milk. They are hoping to have their first bottle of Little Murray Dairies milk on a shelf somewhere in about six months while the aim is to produce high-quality butter on a small scale.

Mr Bethune was awarded a Nuffield scholarship in 2003 and submitted his paper on 'Patterns of Profit in the Australian Dairy Industry' in 2005.

The property and business are impressive with good new infrastructure and enthusiastic and knowledgeable operators. The communication and machinery for employees are solid with a whiteboard showing "things to do this week" on the dairy shed wall.

Labour is available locally and Mr Bethune does not use backpackers; he prefers employees to be more Lake Boga based. One fascinating aspect of this region is the difference between cultivated irrigated land and the dry natural land. This certainly highlights the effect of good irrigation and allows a business like Lake Boga Pastoral to thrive. D

Utilising effluent pond sludge

Key points

- ✔ Effluent ponds require desludging for optimal performance
- ✔ Several methods available to desludge a pond
- ✔ Plan for how solids will be stored or used

By **Sarah Clack**
Dairy extension officer
Agriculture Victoria

THE build-up of solids or sludge in an effluent system can be problematic as it can reduce the storage volume in single-pond systems and increase transfer of solids into the second pond or storage pond(s) in multiple-pond systems.

On most farms, there are systems in place to manage the liquid effluent fraction, often through dedicated or existing irrigation infrastructure. However, solids are typically more difficult to manage and usually require the farmer to engage a contractor with specialist equipment.

Sludge can be removed from ponds using an excavator.

Effluent ponds are designed to accumulate a percentage of their total volume as 'sludge storage' and require desludging (e.g. cleanout frequency) when the 'sludge storage' volume has been filled. An accredited effluent system designer will provide an indicative cleanout frequency for both single and multiple pond systems.

The following parameters determine the cleanout frequency:

- The size of the pond.
- The number of cows being milked.
- The time the herd spends on areas draining to the effluent systems e.g. dairy shed, yards, entry-exit laneways and feedpads.
- The effectiveness of the T-piece or liquid transfer between the first and second pond in a multiple-pond system.
- The effectiveness of other solids management prior to the pond system e.g. a trafficable solids trap, run down screen, screw press.

If there are changes to the parameters above, the clean-out frequency will be affected. For example, doubling the milking herd from 200 cows to 400 cows will increase the time the herd spends on areas draining to the effluent system. This will result in a higher manure loading (e.g. more solids) into the pond system and decrease the time between cleanouts.

There are some indicators for when a pond should be desludged. In a single-pond system an accumulation of sludge reduces the pond's capacity to store effluent over the wetter months of the year when irrigation is not recommended.

If the final-pond in a multiple pond system is starting to develop a floating crust or has gas bubbling, then desludging may be required to improve effluent quality for irrigation or recycling for yard washing.

There are several ways to remove solids from an effluent system. These include pumping with agitation, vacuum tankers, and excavators. The volume of sludge in the pond(s) and availability of other manure (e.g. dry-scraped from a feedpad or trafficable solids trap) will influence how sludge is managed.

Local contractor slurry services will provide pumps, stirrers and tankers. The are several machinery dealerships and farmers that dry-hire vacuum tankers, stirrers, manure spreaders and high-horsepower tractors. Costing should be considered when selecting the best option for the farm, as larger ponds can be time-consuming and expensive to desludge.

Agitation and pumping

Agitation assists to raise and mix accumulated nutrients and salts in the lower layers of sludge, which will reduce pond performance over time. Agitation or stirring also assists in breaking down solids, creating a more liquid consistency making it easier to pump. Pumping

in freshwater or recycling effluent from the final pond will improve agitation and assist the breakdown of a floating manure crust.

A specialist sludge pump should be used that can efficiently pump liquids with a high suspended solids content.

Vacuum tanker

Vacuum tankers or slurry tankers can be used to suck sludge from ponds under agitation and transport it for direct application through dibble bars or splash plates. Tankers are typically 8000-15,000 litres. When assessing the cost-effectiveness of different contractors, it is important to seek a total cost per megalitre applied (i.e. $/ML) and not their hourly rate. Experienced contractors will often operate larger tankers that have a more expensive hourly rate, but it is likely their rate will include agitation and a quick-fill setup at the pond that will result in the cheapest cost per megalitre applied.

Excavator

An excavator can be used to dig out the sludge. To make the sludge easier to handle with an excavator, as it often acts like a liquid, reducing the water content of the sludge can assist.

Use the normal liquid distribution system to remove as much liquid as possible; for gravity systems this can be difficult. Where possible the effluent stream may be diverted around the solids pond into another pond or irrigated directly, if conditions are suitable, for a short period to assist further drying.

The solids can be applied directly to maximise the use of nutrients or stockpiled on a drying or evaporation pad and spread at a time convenient to the farm. Stockpiling sludge will result in the loss of nitrogen through volatilisation.

Manure or sludge needs to be stockpiled away from waterways on an impermeable, bunded surface. Run off from this area should be diverted back in to the effluent system.

The nutrient content of the sludge, along with liquid effluent, can vary widely from farm to farm.

Taking a sample of the effluent for analysis is the best way to determine the nutrient content. It is best to take samples when the pond has been agitated, if agitation is used to remove the sludge, as the nutrient within the sludge changes with depth. This may be completed when the contractor is there applying the effluent. This will not influence the application this time but will provide a better indication when next utilised compared with the use of 'industry averages'.

Applying sludge to areas of the farm low in nutrients will assist making the best use of the nutrients contained in the sludge. Preferably, apply sludge to areas that do not receive liquid effluent to increase the distribution of nutrient across the farm.

Modify the application rate of other nutrient sources to account for the nutrients within the sludge to produce the best returns. Regular soil testing is important to monitor farm nutrient distribution.

Sludge or manure can be applied to established pasture and crops, or prior to cultivation. If applying to established pasture or crops, ensure the application rate does not smother the plants. Our research carried in South West Victoria indicates a sludge application rate of 5-10 millimetres on established pastures provided the best returns. Higher application rates can be used when applied prior to cultivation before sowing forage crops or pastures.

Not all the nutrients in the sludge will be available within the first year. Our research showed an increase in dry matter production three years after the application of sludge. Apparent nitrogen recovery or the proportion of the total nitrogen applied that is taken up by pasture was found to be 40-50 per cent in year one, 10-20pc in year two and 5-10pc in year three.

The Dairy Australia Nutrients from Effluent and Sludge Calculator is one tool that can assist farmers and agronomists determine an appropriate application rate for dairy farm sludge and/or effluent. It is available at website <http://www.dairyingfortomorrow.com.au/tools-and-guidelines/nutrients-from-effluent-and-sludge-calculator/>.

After application, a withhold period of three to six weeks should be observed to reduce palatability issues and minimise the impact of increased nitrate levels. Sludge can also interfere with the mineral balance of the forage grown for a few months post application. It is suggested to avoid grazing classes of stock susceptible to milk fever.

Effluent ponds can have steep sides and be overgrown with grass and weeds. Implement appropriate safety controls for staff and machinery before undertaking pond maintenance activities. D

For more information on using and management of dairy effluent contact a Agriculture Victoria dairy extension officer.

WHAT'S ON

November 13-14 Melbourne, Vic	**Dairy Farmers Milk Co-operative National Convention** Phone: (02) 8120 4431 Email: <info@dfmc.org.au> Website: <www.dfmc.org.au>
November 14 Smithton, Tas	**Employing People On Our Dairy Farms Workshops** Contact: DairyTas Phone: (03) 6432 2233 Website: <https://www.dairyaustralia.com.au/events-calendar>
November 14 Leongatha, Vic	**GippsDairy Women in Dairy - Farm Safety Manual** Contact: GippsDairy Phone: 0448 681 373 Email: <leah@gippsdairy.com.au> Website: <https://www.dairyaustralia.com.au/events-calendar>
November 15, 22, 29 Rushworth, Vic	**Free Mental Health First Aid Course** Contact: Jane McPherson Phone: (03) 5484 4485 Email: <administration@campaspepcp.com.au> Website: <https://www.dairyaustralia.com.au/events-calendar>
November 15 Smithton, Tas	**DairyTAS annual general meeting** Contact: DairyTas Phone: (03) 6432 2233 Website: <http://www.dairytas.com.au/>
November 16 Bega, NSW	**Bling on the Rain farmer dinner** Website: <https://www.dairyaustralia.com.au/events-calendar>
November 19 Belvidere, SA	**DairySA Ladies Lunch (Central)** Contact: Beck Burgess Phone: 0438 262 966 Email: <beckburgess@dairysa.com.au> Website: <https://www.dairyaustralia.com.au/events-calendar>
November 21-23 Palmerston North, NZ	**Australasian Dairy Science Symposium 2018** Contact: ADSS 2018 Managers Website: <http://www.adss2018.co.nz/>
November 22 Taree, NSW	**End of year social event** Contact: Mid Coast DAGS Phone: 0400 136 229 Website: <https://www.dairyaustralia.com.au/events-calendar>
November 23 Bunbury, WA	**Western Dairy Spring Field Day & AGM** Contact: Western Dairy Phone: 0418 931 938 Website: <westerndairy.com.au>
November 23 Cohuna, Vic	**Longer Term Planning Day 1** Contact: Murray Dairy Phone: (03) 5833 5312 Website: <https://www.dairyaustralia.com.au/events-calendar>
November 26- **December 1** South Island, NZ	**New Zealand study Tour and Pasture Summit** Contact: Dairy Australia Website: <https://www.dairyaustralia.com.au/events-calendar/event?sfid=7016F000002RmpAQAS#>
November 27 Yahl, SA	**DairySA Ladies Lunch (South East)** Contact: Bec Walmsley Phone: 0418 951 324 Email: <rebecca@dairysa.com.au> Website: <https://www.dairyaustralia.com.au/events-calendar>
November 30 Melbourne, Vic	**Dairy Australia annual general meeting** Contact: Dairy Australia Phone: (03) 9694 3777 Email: Website: <www.dairyaustralia.com.au>
December 5 Mt Gambier, SA	**People Drop in Session** Contact: Kylie Boston Phone: 0407 231 547 Email: <kylie@dairysa.com.au> Website: <https://www.dairyaustralia.com.au/events-calendar>
December 6 Hamilton, Tas	**Employing People On Our Dairy Farms Workshops** Contact: DairyTas Phone: (03) 6432 2233 Website: <https://www.dairyaustralia.com.au/events-calendar>
December 8 Circular Head, Tas	**Circular Head Agriculture Show** Contact: Phone: 0456 003 609 Email: <chagsociety@gmail.com> Website: <http://www.circularheadshow.com.au/>
January 20-24 Tatura, Vic	**International Dairy Week** Contact: Robyn Barber Phone: Email: <info@internationaldairyweek.com.au> Website: <www.internationaldairyweek.com.au>
February 13-15 Allansford, Vic	**Sungold Field Days** Contact: Phone: (03) 5565 3142 Email: <sungold.fielddays@saputo.com> Website: <www.sungoldfielddays.com.au>
February 19-21 Canberra, ACT	**Australian Dairy Conference** Website: <http://www.australiandairyconference.com.au/>
February 24-28 Paris, France	**SIMA and Simagena 2019** Website: <http://en.simaonline.com/>
March 11-14 Asakusa, Japan	**International Conference on Lameness in Ruminants** Website: <http://web.apollon.nta.co.jp/lamenessinruminants2019/>
March 19-20 Bendigo, Vic	**Herd 19 Conference** Phone: Website: <www.nhia.org.au>
March 22-29 SA and Vic	**International Red Dairy Breeders Federation conference and tour** Contact: Kylie Boston Phone: 0407 231 547 Email: <kylie.smc@bigpond.com> Website: <www.irdbf2019.com.au>

Good crush, bad crush

By **Ee Cheng Ooi***

Key points

- ✔ Some cattle crush designs are better than others
- ✔ Bad crushes can be dangerous for people and animals
- ✔ Good conditions cut vet's time, cutting cost to farmers

A crush with sides that open is welcome.

THERE'S something uniquely depressing about arriving at someone's farm excited for the arrival of their new crush, only to discover that the new one is worse than the one it replaced. You walk glumly up to the shiny new frame, knowing that you have another 10 years of this ahead of you until you can convince the farmer's son or daughter that it might be time for a change.

Occupational health and safety is a topic about as fun as dentist visits or pressure hosing 'mud' off the walls in the dairy. However, it is an extremely important topic — especially for those of us who constantly work in the firing line with these great big (and beautiful) animals.

Here's a top 10 list of crushes that we'd prefer not to see.

1. The really long crush without a side gate.

Good exercise initially, but after climbing over the fence for the sixth time, you start wishing you'd brought a student.

2. The brand new crush that has been sitting next to the old crush for six months now.

The new one is shiny, expensive, and mainly used to hang up bits of string and calving ropes. When is it going in? Nobody ever knows.

3. The crush with expensive 'features' that make life worse.

Auto-shutting gates that trap you behind the cow, winches for lame feet that disengage unpredictably and triangular revolving back gates that the cow 'just needs to push with her head to get past' fall into this category.

4. The 'walk-through' head bail.

The cows walk through nicely the first time — and they learn quickly. Follow-up visits become a nightmare of trying to push 800kg cows into the auto-locking mechanism with all their brakes on.

5. The crush that doesn't have split-side gates or has sides that don't open.

Trying to do surgery with the cow fish-tailing from side to side, or doing front feet with the hoof suspended in the air is a good recipe for gritted teeth at best and then frantic yelling when it all goes pear-shaped.

6. The crush that isn't bolted in.

It works fine until the bull takes off across the paddock wearing the crush like a fashion statement. It's also incredibly dangerous when your patient (inevitably a mad beef heifer) lunges forward and tips it over, taking you out with it.

7. The head bail that slips open if you don't tie down the lever.

You always find out about this at the worst possible moment, like when the cow's back hoof is tied up or you've got an arm up her backside.

8. The crush that opens from the front, with a bolt that falls out when the cow thrashes her head around just a little bit.

It is an especially nasty surprise when you're trying to drench a cow and she tosses you to one side and tries to run away. Her head will inevitably be stuck in the wildly-swinging front gate and before you know it, you're trying to back up a panicking cow without getting bashed or trampled.

9. The crush that kills cows that go down.

V-shaped head bails and front plates are notorious for this. Watching a cow choke to death while you're desperately trying to lift her head up is an intensely miserable experience. Plus, even the cows seem to recognise that it's a silly set up and refuse to put their heads in, no matter how much you try and tempt them with sweet words or pellets.

10. The 'crush' that is actually a bloke pushing the cow up against a fence using a rusty old gate.

This can work in a pinch but raises your blood pressure to an unhealthy degree. It often involves some kind of invasive abdominal surgery and a farmer helper who is well past the recommended age of retirement.

So what do we like to see? Nothing is happier for a vet than to show up to a sturdy crush with a sensible design, especially if it's undercover on a hot or rainy day. A great race leading up to the crush makes a big difference. In general, we're looking for minimal bells and whistles, and maximum sense and safety. A handy can of WD40 goes a long way.

Good working conditions allow us to do a wider range of procedures, and to do a better job at doing them. We'll be out of your hair quicker, which helps to keep your costs down, and we get to keep our teeth — which is always a lovely bonus. D

**Ee Cheng Ooi is a dairy veterinarian and fertility researcher in Northern Victoria.*

All comments and information discussed in this article are intended to be of a general nature only. Please consult the farm's vet for herd health advice, protocols and/or treatments that are tailored to a herd's particular needs.

DataGene
Solutions for Herd Development

App cuts herd management stress

Key points

- ✔ Herd calves three times a year
- ✔ HerdData app allows for accurate record keeping
- ✔ Provides quickly accessible information about herd

Above: Allen Hook uses the HerdData app every day on the farm he manages at Oxley Island, NSW.
Right: The HerdData app puts information about every cow at the farm manager's fingertips.

ACCURATE and up-to-date paperwork is crucial for all dairy farmers. But as a farm manager, Allen Hook says the ability to keep precise records is what keeps him in a job.

Mr Hook manages a herd of 300 mostly Jersey-Friesian cross cows at Oxley Island, NSW.

"When you manage a herd you have to have your paperwork perfect," he said. "You won't get a managing job if you don't have the data at your fingertips and make the right decisions."

The herd calves three times a year: in February/March (more than 200), the middle of the year and November. Correct and up-to-date herd records have been the key to running a smooth operation.

That's where DataGene's HerdData app fits into the business.

Mr Hook first downloaded the app last year when he worked at another farm. He was interested in finding an easier way to record herd data but also a system that meant these records could be accessed quickly.

HerdData is an app for mobile devices that makes it easy to enter and access herd records and also synchronises data with herd management software.

A few months into Mr Hook's new management role at Oxley Island, HerdData is again proving its worth.

Herd recording has become easier thanks to the app, saving Mr Hook time and stress in searching back through paperwork. "It keeps your paperwork up to date," he said. "You are actually doing the paperwork on the app, the app is the paperwork.

"If I didn't have this, I would have had to sit down for hours trying to work out what cows were in the herd, what has been dried-off and what has calved. With the app you are doing it on the spot, every day, it is in your pocket and it is just done."

This organised method helps during joining and pregnancy testing, with Mr Hook's approach even attracting praise from the vet as the accurate records leave little room for error.

The "massive batch calving" in February/March means joining is tight. Artificial insemination (AI) runs across six weeks with records kept about each joining, as well as heat observations and other health concerns.

These records are then printed out and used by the vet during pregnancy testing.

Mr Hook said one of the most useful functions of the app is the "bull team" section. "The app has the whole bull directory in Australia — when you add that bull to the bull team it gives you all the details of that bull," he said.

"When you AI a cow, you go to the bull team and it's easy to record the one you've used."

Transition cow management is also easier with HerdData, thanks to calving and dry-off date notifications.

"In the settings, you can select your dry-off period and it will notify you when you want to dry them off," Mr Hook said. "At the moment, it is set at 56 days but you can set it to anything you like."

The Oxley Island herd produces about 28 litres a cow a day with 3.8 per cent milkfat and 3.67 per cent protein.

The herd has a bulk milk cell count of about 70,000 cells/millilitre and maintaining this premium milk quality level is a high priority for the Norco suppliers. HerdData helps deliver top quality milk by assisting the management of potential issues by providing quick access to accurate data on individual cows. "We look at the cows that have repeat cases of mastitis and because you can look up that individual cow it gives you her history, cell count, lactations and production, you can make the important call to cull her if she is a repeat offender and if she's not performing where she should be," he said.

Information about drug administration is also stored in the app via the drug cupboard function. Mr Hook said he used this to keep track of milk and meat withhold periods.

Mr Hook said the thorough historical database of the entire herd, plus all the young stock on the property, helps with future breeding decisions.

Heifer calves are given a number and immediately linked to their mother as the calving information is entered straight into the app via a mobile phone down the paddock. Bull calves are sold and this is also recorded in the app.

Mr Hook said the app acted as a "big pedigree book" with dam and sire information attached to the calf. "With the app we can look back and make better calls to have better bloodlines," he said.

"It is really, really good and it makes my life easier and keeps me in a job," he said of the app. "If I didn't have the programs I have, I wouldn't be able to have the job I have."

HerdData registrations start at $99 a year for one to two mobile devices. D

For more information contact DataGene, phone (03) 9032 7191 or email <abv@datagene.com.au>.

Dairy Australia
Your Levy at Work

Taking Stock program shows way forward

Key points

- ✔ Complete a Taking Stock assessment with an expert consultant
- ✔ Complete a forward budget every three months
- ✔ Engage nutritionist to investigate home-grown feed options
- ✔ Regular off-farm time to meet and talk with other farmers
- ✔ Consider off-farm income

WHEN starting dairy farming during the worst drought in a century, a helping hand is much appreciated.

Emily and Matt Neilson started milking on their Bandon Grove, NSW, dairy farm three-and-a-half years ago and have since battled the milk price crash and a devastating drought.

When Mrs Neilson heard about Dairy Australia's Taking Stock program, which offers farmers free one-on-one visits from a farm consultant, she signed on straight away.

Since then, things have been turning around for the Hunter Valley farmers, who have finally received some significant rain and have made their own luck by changing important parts of their business.

"The last 12 months have been especially challenging, so any advice we could get was appreciated," Mrs Neilson said.

"The attraction of Taking Stock was having that third party looking over our finances, telling us where we should pull things in and how to work towards our goals while staying out of a big financial hole.

Taking Stock was of particular benefit to Mrs Neilson, who handles the farm business finances, despite having no formal training in that area.

"For (consultant John Fitzgerald) to say that we are doing the right things, it was really good for me because all the weight of the finances falls on me," she said.

"The biggest thing was that he told

Taking Stock has helped NSW dairy farmer Emily Neilson take control of her farm business.

Taking Stock available to all

DAIRY Australia's Taking Stock program can be booked by dairy farmers across the country, including farmers who are not facing drought conditions.

Sessions take place on farm, are private and confidential, and aim to help farmers map out a plan for the season ahead including next steps.

The consultation is focused on providing customised advice tailored to the needs of each individual farm and may include any physical, financial and people issues that are identified, resulting in a tailored action plan.

This could include:

- Feed options, planning and budgeting.
- Managing a fodder shortage.
- Herd decisions and animal health.
- Cash budgeting.
- Managing the farm team during tough times.
- Meet the bank.

Book a free Taking Stock session by contacting the local Regional Development Program.

us that we were doing well. At the time, we were just getting through each day, so having someone tell us that we are on the right track just gave us a bit of a boost.

"It was really good for budgeting strategies. It put us on the right track. We are now budgeting more often and more accurately.

"We were doing a budget every six months, and John pushed us towards doing it every three months. Having it done more regularly and accurately has definitely been beneficial to the business.

"The main thing that we were doing well was that we were paying everything on time and were up-to-date with managing bills and we didn't owe anything except our loan.

"We were rearing bull calves to sell, which was adding to cash-flow, which was another tick."

Subsequent to the Taking Stock analysis, the Neilsons decided to engage local nutritionist Neil Moss, a decision that has had a profound impact on their farm business. "It's the best thing we ever did," Mrs Neilson said.

"We came to a point where we could not afford to buy any more forage, so everything the cows needed to eat, we had to grow.

"We took on Neil and he really helped Matt by sitting him down and making him create a plan and look at crop varieties and then held him accountable. Working with a nutritionist, especially for drought-affected people, can help get them through."

With enough rain in the soil, Mr Neilson will be looking at summer cropping to help get the herd through the dry months.

"We always sow sorghum and we will do that again, but we have never sown millet and we are going to give that a go," Mrs Neilson said.

Having benefited from Taking Stock, Mrs Neilson is encouraging other farmers to take up the offer of the Dairy Australia program.

"It's free — so why not," she said.

"When you've got your head down and you are so busy just trying to get through each day, it's great to have someone come in and say that it's not that bad, or this is something we can do, or to offer an out-of-the-box idea on how to generate income.

"Anyone from outside your farm is going to have fresh ideas which might just make you try something a bit different."

Mrs Neilson said maintaining a positive attitude was important during a stressful time, with her off-farm work as a Young Dairy Network co-ordinator helping to bring in outside income and give her a break from the stresses of running a farm business.

"It was during this period that I started working with YDN, which has really helped me," she said.

"It got me off farm and talking to other farmers who are in the same boat as us. Just to have those days away from the farm has made a big difference." D

Feed budgeting vital this summer

Key points

- ✔ Tools available to help with feed budgets
- ✔ Use Back of the Envelope Feed Budget for quick assessment
- ✔ Dairy Feed Tools provided more detailed cashflow approach

WITH fodder and grain prices high, it becomes even more important to know how much feed is needed in the coming months to meet milk production requirements.

Murray Dairy regional extension officer Lisa Birrell said there were a number of options for farmers looking for assistance when it came to feed budgeting, including Dairy Australia's *Back of the Envelope Feed Budget* factsheet and *Dairy Feed Tools*.

"The back of the envelope feed budget from Dairy Australia is a quick way to look at how many cows you've got, how many young stock you've got and how much feed you will need," she said.

"Included in that is a water budget to find out how much water will be used to grow summer crops or pastures for grazing or for conserving, and then, come autumn, what water is left and what water will need to be purchased for autumn start-up."

'There were a number of options for farmers looking for assistance when it came to feed budgeting.'

Ms Birrell said the simplified budget also allowed farmers to assess how many tonnes of grain they would look to feed this year and also work out the forage or fibre required from the hay market.

Alternatively, Dairy Australia has an Excel-based feed-budgeting tool and *Dairy Feed Tools* for farmers who wanted to work out what the feed budget would mean in terms of cash-flow and on a month-by-month basis.

"With the Excel spreadsheet you can break it into a season whether it's spring, summer, autumn or winter and you can build it with number of cows, number of young stock and how many litres you think these cows will be producing," Ms Birrell said.

"You can add in how much green feed you think you'll have, how much grain you think you'll feed and you can build it month by month. You can work out whether you've got a surplus or whether you've got a deficit."

Ms Birrell said the *Dairy Feed Tools* could also help farmers balance rations.

"Dairy Feed Tools can show not just how many tonnes you need but what is actually going to be a balanced ration to hit the production targets that you are aiming for," she said. D

For more information on feed budgeting go to <dairyaustralia.com.au/feedshortage>. The *Back of the Envelope Feed Budgeting* factsheet, the Excel-based feed budgeting tool and *Dairy Feed Tools* can be found there and freely downloaded.

The approach to managing residuals in dry conditions is, in essence, similar to that adopted to avoid pugging under waterlogging conditions in winter.

Key principles for summer grazing

Key points

- ✔ Keep pasture residuals at 4-6cm
- ✔ Carefully choose sacrifice paddocks
- ✔ Feed budgeting will help plan ahead for herd feed requirements

BEST management practice of ryegrass and managing the residual height throughout dry periods is critical to enhance persistence of pasture.

The key points for managing grazing residuals during dry conditions are:

- Do not over-graze if possible, maintain the residuals at 4-6 centimetres. Cows tend to graze down below this in drier conditions, so grazing needs to be restricted. Grazing to 2cm, for example, will significantly reduce yield in the following rotations.
- Aim to maintain some green material throughout drier times (e.g. green stem, pseudo stems), as this will help survival and regrowth. The presence of some pasture cover by maintaining residuals at 4-6cm creates a more favourable microclimate near the soil surface than when grazed below this. The microclimate can help retain soil moisture close to the surface and create protection from extreme soil surface temperature.

To achieve these aims is a significant challenge on dairy farms with high stocking rates when the rainfall and temperature is not sufficient to support pasture growth.

It is necessary to have a set strategy or plan to avoid over-grazing. The approach to managing residuals in dry conditions is, in essence, similar to that adopted to avoid pugging under waterlogging conditions in winter.

'It is necessary to have a set strategy or plan to avoid over-grazing.'

The strategy is to keep the cows in a reduced area (sacrifice paddock or on a feedpad) where they can be fed, and graze only the paddocks where pasture is at 2.5-3 leaves.

Paddocks suitable for use as sacrifice paddocks should have the following:

- Good stock water access.
- Good shade.
- Close proximity to the dairy.
- Been previously identified for renovation.

By feeding out in the sacrifice area or feedpad, the cows will be less hungry when entering a new strip of grass, making it easier to control the grazing intensity and leaving a residual close to the target.

A good estimation of pasture pre-grazing cover and knowledge of the paddock dimensions is also essential in order to allocate pasture more accurately and achieve the target residuals.

This management increases the persistence of pasture sward, which will be in a much better position to recover from the dry period once the first significant rainfall event occurs.

This may mean that paddocks need to be rested for an extended period.

Developing a feed budget will help to calculate and plan how much feed will be required to feed the herd in the coming months. D

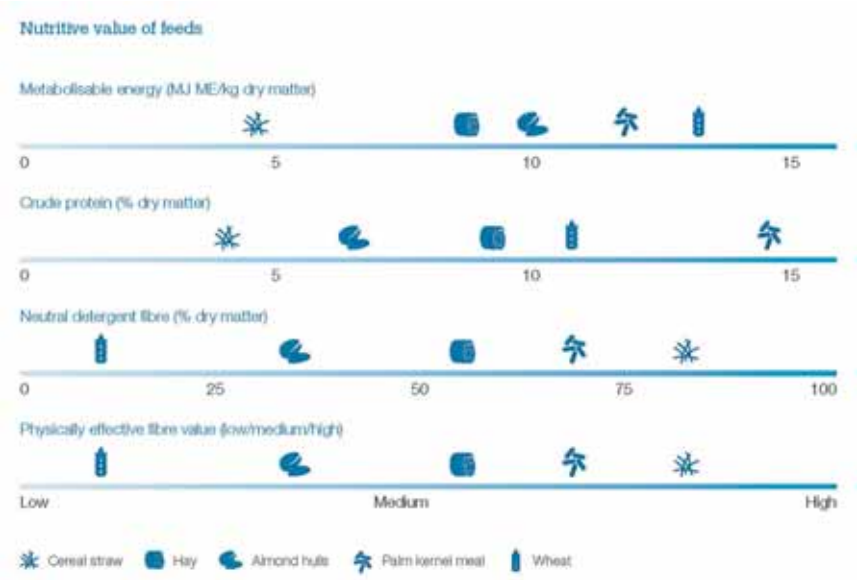
Dairy Australia's Feed Tools at website <www.feedtools.com.au> is a useful tool to determine feed requirements for the herd.

Ensuring there is enough feed for the herd will reduce the risk of overgrazing and ensure pastures recover when rainfall occurs. The feed budgeting fact sheet at <dairyaustralia.com.au/feedshortage> provides mor

Crunch numbers on alternative fibre

Key points

- ✔ Alternative fibre sources can be suitable
- ✔ Supplement with high energy feeds and protein sources
- ✔ Be aware of levels of neutral detergent fibre



WHEN pasture is limited and supplies of fodder are reduced, farmers may need to consider using alternative fibre options that they may not have used before.

Dairy Australia program manager Cath Lescun said many alternative fibre sources were suitable for feeding to dairy stock provided they were supplemented with high energy feeds and protein sources as part of a balanced diet.

The alternative fibre sources vary widely in nutritive value, digestibility, effective fibre value, and may present risks such as ruminal acidosis, mycotoxins and chemical residues.

Alternative fibre sources that may be available depending on seasonal circumstances and location include almond hulls, palm kernel meal, cereal straw (barley, oats, triticale, wheat and rice straws), sugar cane and grape marc.

Fibre facts

Fibre is an essential ingredient in the diets of ruminant animals such as dairy cattle. It supplies energy, maintains normal, healthy rumen function, and in cows is utilised to produce milk fat.

The most commonly used chemical measure of the fibre content of a feed or a diet is Neutral Detergent Fibre (NDF).

The 'physically effective fibre value' of a feed or a diet is also critical. It refers to the ability of a feed to stimulate rumen contractions, stimulate chewing activity and production of saliva, which contains buffers that maintain the cow's ruminal pH in the optimal range (6.2-6.6) for growth of rumen microbes.

NDF intake should ideally be about 28 to 35 per cent of the total diet to maximise daily dry matter intake, however, cows can eat up to levels of 35pc of the diet with minimal impact on intake. Above 35pc NDF, dry matter intake will decline, especially if the diet is forage based.

'The alternative fibre sources vary widely in nutritive value, digestibility and effective fibre value.'

About 25pc of the fibre in the diet should have a fibre length of about 2.5 centimetres. Diets containing rapidly digested starch sources such as wheat should have higher levels of NDF (minimum 34pc).

A rule of thumb for NDF intake is 1pc of bodyweight as forage NDF or 1.2pc of bodyweight for total NDF intake. For example, a 600-kilogram cow can eat 6kg dry matter of NDF per day from forage or 7.2kg DM of NDF/day in the total diet.

If there is not enough long or 'effective' fibre, there will not be enough chewing during eating and ruminating, and therefore not enough saliva produced, leading to a drop in ruminal pH and increased risk of ruminal acidosis.

Cattle can suffer from two forms of ruminal acidosis:

- 'Sub-acute ruminal acidosis' (SARA), where the ruminal pH is in the range 5.5-6. Cows may not appear sick, but some will be off feed, have mild milk fat depression and be scouring.
- 'Lactic acidosis' where the ruminal pH is below 5.5 — cows will be noticeably sick. Many cows will be off their feed, down in their milk, lame and scouring. This may then progress to 'downer cow' syndrome and death. D

For more information about fibre and alternative fibre sources go to the Fact Sheets at the Feed Shortage 2018-19 website at <www.dairyaustralia.com.au/feedshortage>. There is technical information about fibre, including the A-Z of fibre sources, and ruminal acidosis listed under the Feeding the Herd section.

Low-cost tactics can keep cows cool

Key points

- ✔ Be proactive to prevent heat stress
- ✔ Night-time temperature critical
- ✔ Tools available on Cool Cows website

EASY-TO-IMPLEMENT, low-cost measures are being used to reduce heat stress and keep cows cool heading into summer.

With El Niño conditions predicted, herds in drought-affected regions will be particularly hit by heat and humidity, while dairy regions in southern Australia should also plan for any extreme heat.

The University of Queensland School of Agriculture and Food Sciences Assoc Prof John Gaughan, who has been researching heat stress in dairy cows for 20 years, said early intervention was the key to reducing heat stress.

"I think we can safely say that the incidence of heat stress is increasing — especially extreme events," Assoc Prof Gaughan said.

"But having said that, the adverse outcomes have decreased, in part because people are more aware, and have some strategies in place to decrease the negative effects."

Ensuring cows are cooled before and after milking and being proactive are key strategies used on farm.

"Don't wait until cows are hot — be proactive," Assoc Prof Gaughan said.

"Research is showing that night-time minimum temperature is in some ways more important than the day-time maximum — if it is a hot night, earlier and longer cooling may be necessary."

Assoc Prof Gaughan's research has highlighted the potential for cows in southern regions to be susceptible to extreme heat events.

"Cows in the south are particularly at risk of heat stress coming out of winter, and are more exposed to extreme heat events," Assoc Prof Gaughan said.

"In northern regions, high heat load, primarily due to high humidity, could subject cows to a higher incidence of heat stress.

"High-production cows are also more at risk of heat stress — in terms of milk yields, milk quality and reproduction. The reproduction effects can be long term."

Ensuring water is readily available for cows is a low-cost option to help reduce heat stress.

> ***'I think we can safely say that the incidence of heat stress is increasing — especially extreme events.'***

Western Victorian veterinarian and dairy consultant Tom Walsh said cows would feel the effects of hotter weather more when humidity was higher, which was more likely in coastal areas in NSW and Queensland.

"Having a plan for dealing with hot weather is essential to maintaining a happy, productive herd over summer," Mr Walsh said.

As costs are increasing on farm, simple steps can be taken to reduce heat stress.

"A lot of farm budgets are becoming tighter and for many farmers, going out and spending money on major infrastructure is fairly difficult right now," Mr Walsh said.

"But there are shorter term and cheaper options available that can at least give farmers some capacity to get on top of things and minimise any effects from the heat."

Running a sprinkler in dairy sheds, reviewing milking times, ensuring water is readily available for cows, and keeping track of which paddocks have accessible shade are simple steps farmers can take to keep cows cool.

These are just some of the suggestions contained in Dairy Australia's recently updated Cool Cows website, which includes a range of the latest tools and resources available to assist farmers to keep cows cool this summer. D

To access the Cool Cows website, visit <coolcows.dairyaustralia.com.au>.

For advice or resources to assist the herd's reproduction, visit <www.dairyaustralia.com.au/farm/animal-management/fertility>.

Dairy Australia
Your Levy at Work

Smarter energy use reduces farm costs

Key points

- ✔ Energy audits break down energy use
- ✔ Identify areas to cut costs
- ✔ Receive a cost-saving estimate for different options

AMIDST rising farm costs, Dairy Australia has developed a range of energy information resources to assist farmers to make smarter use of energy to reduce power bills.

The *Smarter Energy on Dairy Farms* booklet, a straightforward guide to reducing dairy farm electricity bills, is now available online at the Dairying for Tomorrow website.

A short guide to energy-related funding for farmers has also been published.

The guide links to a range of grants ranging from government funding to conduct energy audits to Clean Energy Finance programs from NAB, Westpac and Commonwealth Bank.

Dairy Australia program manager Alison Kelly said energy audits provided an opportunity to save money by reviewing and reducing running costs.

"Energy is a major but unavoidable expense for dairy businesses, and farmers want to understand their options to reduce costs," Mrs Kelly said.

"Farmers could reduce their power bills and make their operations more sustainable at the same time by conducting a simple energy audit and implementing any suggested changes.

"If you conduct an energy audit, you will be provided with a breakdown of your energy use so you can identify how to reduce costs.

"You will be given a cost-saving estimate for each of the options available to you, so you can make informed decisions about where to invest and save money in the long term."

For South Australian dairy farmer Michael Connor, conducting an energy audit on his Mt Compass farm, Nangkita Hills Dairy, provided clear and simple opportunities for savings.

Facing year-on-year increases to power bills on his 550-cow farm, Mr Connor and his team decided an energy audit was an important step forward.

"Costs are continuing to go up and the entire dairy industry is being affected," Mr Connor said. "Through an energy audit, we were able to maximise efficiency and really understand what we can do to minimise energy costs."

An energy audit can help farmers make informed decisions about where to invest and save money in the long term.

'We would not hesitate to recommend that other farmers conduct even a basic audit of their energy use.'

The energy audit analysed all of the meters and power use in the dairy shed and across the farm.

At the conclusion of the audit, an extensive report was provided that outlined ongoing energy costs and areas where simple changes could be made to produce significant savings.

The energy audit gave Mr Connor a better understanding of the multilayered on-and-off-peak energy system in South Australia, meaning he was able to save money by adjusting his milking and irrigation routine.

"We were still using the same amount of power but by understanding the best times to operate the dairy and irrigate, we were able to be strategic and save money while not necessarily reducing energy consumption," Mr Connor said.

Since the audit, Mr Connor has planned his power use and adjusted timers to minimise maximum load.

"We would not hesitate to recommend that other farmers conduct even a basic audit of their energy use," he said.

"An independent consultant is able to come to your farm and make meaningful recommendations, giving you a good return on your investment." D

To access Dairy Australia's energy resources, including the *Smarter Energy on Dairy Farms* booklet and funding guide, visit <dairyingfortomorrow.com.au/tackling-specific-issues/energy-2>.

Dairy Australia
Your Levy at Work

What's happening in your region?

Contact your Regional Development Program

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dairynsw.com.au

Murray Dairy
Ph: 03 5833 5312
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DairySA
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To find out more about Dairy Australia visit **dairyaustralia.com.au**

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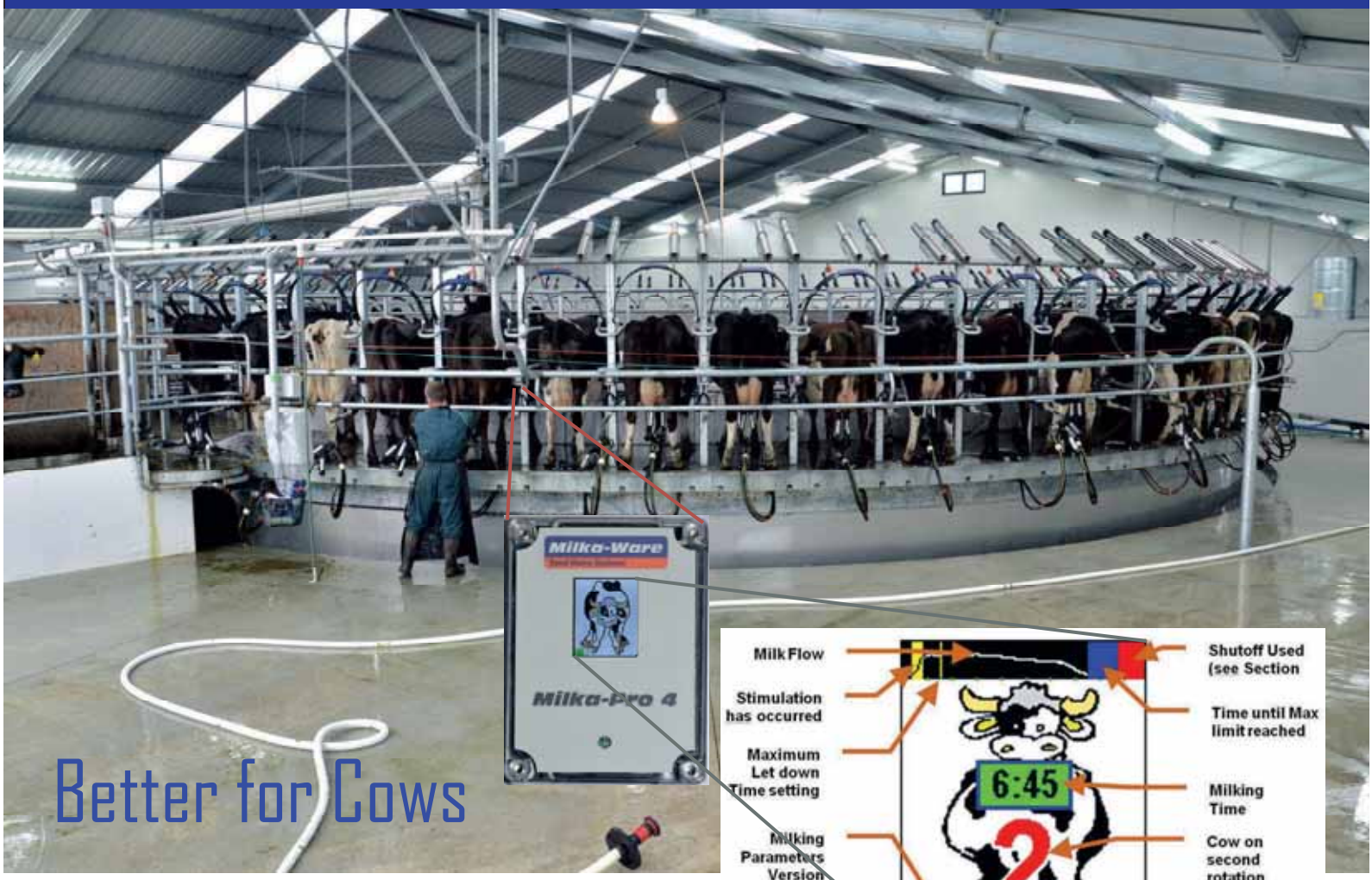

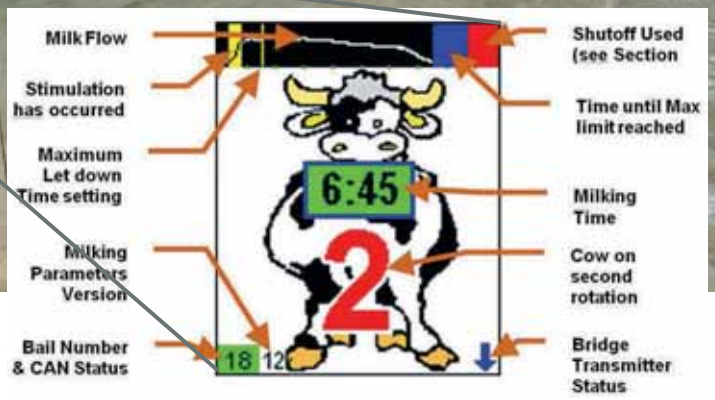

Informative for milkers

Milka-Ware's Milka-Pro 4 ACR system improves milking for cows and for milkers. It's advanced microprocessor enables it to analyse and adapt to each individual animal's milking profile in real time. This means that the cups will be removed at the optimum time for each and every animal, every milking. This ensures complete and clean milking in the minimum time without the need to compromise settings for fast or slow milkers.

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Did she let down well? How long did she take to milk? What is her milk flow profile like? Is she a good producer? At a glance of the in-bail display these questions and more can be answered so you can better understand your cow's milking performance.

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