DataGene
Solutions for Herd Development

Annual Update 2017/18

DataGene is an independent, industry-owned organisation that delivers world-class herd improvement products and services to Australian dairy farmers and their service providers. Our members include leading herd improvement service providers, genetics suppliers, breed associations and peak dairy industry organisations.

Dairy Australia
Your Levy at Work

Australian Dairy Farmers

NATIONAL HERD IMPROVEMENT
NHIA
ASSOCIATION OF AUSTRALIA INC.

ABRI

ABS

AGRI-GENE

Apiam
animal health

AUSSIE REDS

BROWN SWISS
AUSTRALIA
(Joined after 30/06/17)

COBDEN
ARTIFICIAL BREEDERS
CO-OP. LTD.

FARM WEST

Genetics
AUSTRALIA
Breeding better Australian herds

Hico
HERD IMPROVEMENT
CO-OPERATIVE AUSTRALIA LTD

Holstein
AUSTRALIA

Jersey
Australia

LIVESTOCK AND BUSINESS
CENTRE LIMITED

NHD
NATIONAL HERD DEVELOPMENT

NU-GENES
HERD IMPROVEMENT SPECIALISTS

SEMEX

TasHerd
Tasmania's Herd Improvers

VIKINGGENETICS

Wellbred
GENETICS

Yarram
Herd Services

zoetis

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Easier

Faster

Better

Smarter

Chair's report

It is my pleasure to report on the achievements that DataGene has achieved in only two short years. Nearly all of the key players in the herd improvement industry have taken up membership. In the past financial year, we welcomed three new members: Guernsey Australia, Livestock Business Centre and Zoetis Australia. A fourth, Neogen Australia, joined last month. The breadth of our membership base demonstrates that DataGene's roles are valued by the industry.

This Annual Update provides an overview of DataGene's roles and the year's highlights from activities in our three strategic priorities (Genetic Evaluation, Software & Data and Service Culture & Collaboration). We also report on three major industry projects (ImProving Herds, MIR for Profit and Ginfo).

DataGene operated in a challenging financial environment this year, with income significantly impacted by a drop in heifer exports associated with a blue tongue outbreak in Victoria. We managed to minimise the financial impact by trimming or deferring expenditure wherever possible. Overall, our expenditure was below budget, with the exception of our investment in the Central Data Repository (CDR) and new platform genetic evaluation system (GESNP). This expenditure will remain capitalised until the new platform becomes operational. This means that we achieved a surplus of $784,132 for the year. However, the amortisation will begin to be incurred in 2019.

We have continued to improve our routine genetic evaluation and industry project services. Highlights included the release of the world's first breeding value for Heat Tolerance last December; the monthly delivery of Provisional Breeding Values (PBV) between January and June; and the development of a new tools that will ultimately draw upon data in the CDR, including the Genetic Futures Report and the revamped InCalf Fertility Focus Report.

It is encouraging to see the continued acceptance of the Balanced Performance Index (BPI) as the preferred predictor of dairy cattle performance under Australian conditions. Although only released in 2016, the BPI has quickly gained widespread use by farmers, breeding advisors and bull companies.

Despite challenging seasonal conditions for dairy farmers, genomic testing has continued to grow, with a 65% increase in the number of cows and a 22% increase in the number of bulls genotyped during the year. The turn-around times and tracking of this service will further improve once GESNP becomes operational.

This year saw the completion of the collaborative projects, ImProving Herds and MIR for Profit. The former provided concrete evidence of the financial contribution of herd improvement to Australian dairy businesses, while the latter demonstrated that MIR analysis of milk samples can be used to predict energy balance. This opens up the potential to alert farmers to high risk animals and to develop ABVs for health traits.

Before closing, I'd like to pay tribute to John Harlock, a foundation DataGene board member and passionate advocate for herd improvement. It was with regret that we received his resignation just weeks before his untimely passing in July. John had been a strong supporter of herd testing and the Australian genetic evaluation system for many decades. We will miss his practical perspective, historical context and belief in the value of Australian genetics.

Finally, I'd like to thank our many partners, whose collaboration is essential in enabling DataGene to deliver herd improvement services to the Australian dairy industry. They include our members, the farmers whose herd records power the genetic evaluation system, our science collaborators at AgriBio and our funding Partners at Dairy Australia, the Gardiner Dairy Foundation, the Victorian Government and the Federal government.

Ross Joblin
Chair
DataGene

Ross Joblin
Chair
DataGene

CEO's report

Our first full year of operation, 2017/18, was an intense period of balancing developments for the future and maintaining services in the present. I will focus my report on developing for the future while the delivery of services is covered elsewhere in the Annual Update. The two large, multi-year projects DataGene is working through are the redevelopment of the Genetic Evaluation System New Platform (GESNP) and the development of a Central Data Repository (CDR).

I am pleased to report that both projects are nearing completion. These systems will transform our routine services and provide opportunities for new services. GESNP automates many tasks that are currently done manually, and improves the quality assurance capabilities of the system. It will also speed up the calculation of breeding values from a current calculation time of roughly two weeks to just over three days. This speed will enable us to move to more frequent breeding value releases as requested by our customers.

The creation of the CDR dramatically increases the volume of data we can process and opens up opportunities not previously imagined as we enable the combination of disparate datasets.
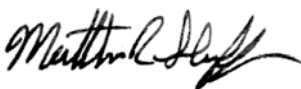
Both projects have taken longer than anticipated, due largely to the complexity of the existing evaluation system and the challenges of connecting vast volumes of data kept in different physical locations and across multiple software platforms. In addition, we have expanded the scope of the projects to include the creation of new customer interfaces and a website. These changes will produce a much better product but have added to the time and complexity of the development task.

A large part of the year has been spent testing GESNP which has, at times, highlighted complications that needed to be addressed. While delays have been frustrating, the finished product will have an extraordinary level of capacity, scalability and reliability. The testing phase has demonstrated that the breeding values generated by the new system are as good, or better, at estimating the genetic merit for all traits. It is vital that rigorous testing occurs at this stage to ensure that when the first public breeding values are released to the industry, there is complete confidence in the system.

DataGene has continued to maintain, and further develop, its relationships with its stakeholders. One key way of ensuring connection has been through the work of the Standing Committees, and in particular the Genetic Evaluation Standing Committee. The committee members contribute enormously to the success of DataGene by ensuring that its stakeholder views are heard. Two new Standing Committees met for the first time this year, the Data and Services Standing Committee and the Herd Testing and Animal Recording Standing Committee. These new groups will evolve to ensure that these important sectors of our industry are well connected and supported.

The key focus for the 2018/19 financial year will be on the testing and successful launch of GESNP and the CDR. Subsequently, the focus will shift to service improvement. The new Gestation Length breeding value is ready to be released with GESNP and for the first time a genomic breeding value for Calving Ease will be released at the same time. On the software side, we will focus on new interfaces for customers to access DataGene services and building new tools for use by our customers; with particular focus on the outcomes of the MIR for Profit project with herd test companies. We will work with our stakeholders to integrate the results of ImProving Herds into industry messages to describe to farmers the value of herd improvement.

I would like to take this opportunity to thank my staff who have worked amazingly hard over the past year to balance the current needs of our customers with their future needs. Their hard work is greatly appreciated and is a cornerstone in the success of DataGene. I would also thank our members for their continued support of DataGene. I look forward to working with you to build the future we are creating on the foundations of GESNP and CDR.

Dr Matthew Shaffer
CEO,
DataGene

Dr Matthew Shaffer
CEO,
DataGene

Solutions for herd development

About DataGene

DataGene is responsible for driving genetic gain and herd improvement in the Australian dairy industry. Its key activities are research, development and extension. DataGene performs many pre-competitive herd improvement operations, including genetic services, software for genetics, herd testing, herd recording and data systems.

DataGene is owned by industry, its foundation members being Dairy Australia, Australian Dairy Farmers and the National Herd Improvement Association of Australia (NHIA). Members include herd test centres, genetics companies, genomic service providers, breed associations and animal health companies (see inside front cover).

Vision

DataGene enables farmers and industry to maximise profit through data-driven decisions.

Mission

DataGene delivers world-class genetic evaluation, software and decision-making tools to enable Australian farmers to improve their herds and maximise their profit through data-driven decisions and innovative industry services.

Strategic relationships

DataGene has five key strategic relationships:

1. **Dairy Australia**, which is the primary funder of DataGene. It is also a client, with DataGene developing software solutions, such as updates to the Fertility and Mastitis Focus Reports, for Dairy Australia.

2. **Australian Dairy Farmers (ADF)**, which ensures DataGene's priorities and activities reflect the priorities of Australian dairy farmers. ADF is a strong public advocate for herd improvement. DataGene also has many direct interactions with farmers.

3. **National Herd Improvement Association of Australia (NHIA)**, which collectively represents its members, many of which are also members of DataGene. Our relationship with these members is essential in the development of new products and services.

4. **Other members**, such as Zoetis and Apiam, provide key relationships for the delivery of DataGene products and services and the development of new products and services.

5. **Victorian Government**. The Department of Economic Development, Jobs, Transport and Resources (DEDJTR) is an in-kind contributor to DataGene. It is also a client for DataGene for some projects, a user of DataGene data and a strategic partner in its provisions of research outcomes via DairyBio.

# Solutions for herd development

Strategic priorities

DataGene's activities are managed within three strategic priorities:

1. Genetic Evaluation Services
2. Software and Data Services
3. Service Culture and Collaboration

Pages 8 to 17 present achievements in each Strategic Priority.

Products and services

DataGene products and services are delivered to Australian dairy farmers either directly or via third parties. Fees are charged in specific cases where there is a direct economic benefit to the individual customer. Some products and services are not charged.
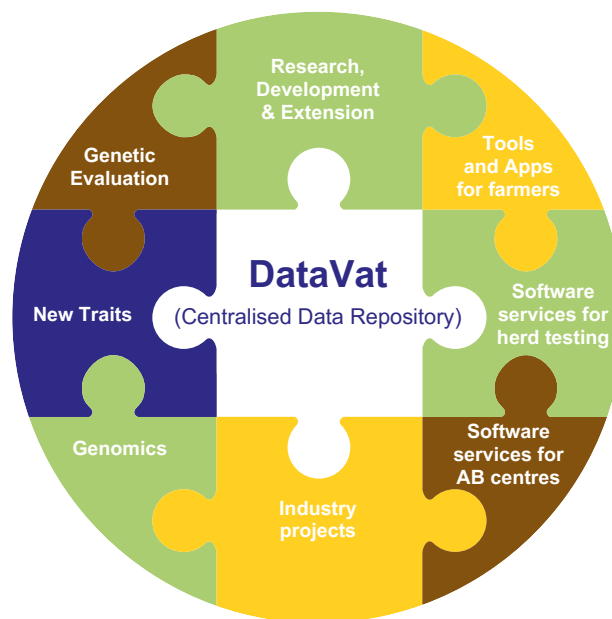
Products and services delivered directly	Fee for service
Good Bulls Guide and App	✗
Website (information and data)	✗
ABV(g) reports to service providers	✓
Bull proofs to bull companies	✓
Project management services to industry organisations	✓
Centre and inventory software to service providers	✓
Software development services to industry	✓

Products and services delivered through third parties	Fee for service
HerdData App (via herd test centres)	✓
Herd Test Dashboard (via herd test centres)	✗
Genetic Progress Report	✗
Extension messages (via Regional Development Programs)	✗

Highlights 2017/18

Strategic Priority 1: Genetic evaluation services

Providing world-class genetic evaluation services drives genetic gain and allows farmers to breed more profitable cows. DataGene is focussed on:

- Increasing the reliability of Australian Breeding Values (ABVs).
- Improving service delivery.
- Increasing the uptake of services by farmers and industry.

The Genetic Evaluation Standing Committee gives industry direct influence over genetic evaluation policies and priorities for future development (refer to page 20).

The December 2017 ABV run saw the release of the new Heat Tolerance ABV. A world first, it allows farmers to identify animals with greater ability to tolerate hot, humid conditions with less impact on milk production.

The Heat Tolerance ABV is one of a new generation of breeding values for traits that are difficult to measure, made possible by advances in genomic technologies and Ginfo, Australia's genetic reference population (refer to page 17). To help bull companies prepare, the Heat Tolerance ABV was included in provisional breeding values (PBV) releases in the lead-up to the public release.

In addition to the three public releases of ABVs in April, August and December, DataGene provided monthly PBV releases to bull companies and genomic results to farmers from January to June 2018. This service will be automated and routine once the genetic evaluation system new platform (GESNP) is operational.

The development work for a new Gestation Length ABV has been completed and this trait is scheduled to be included in public ABV releases from 2018/19. Using bulls with a shorter gestation length will provide an option for farmers to manage late-calving cows without the issues associated with calving induction.

Similarly, the development work for an updated Calving Ease ABV has been completed and is scheduled for public release in 2018/19. The inclusion of genomics in the updated model means it will be more reliable and available for many more bulls than in the past, including young bulls.

Key deliverables

✓ Public release of Heat Tolerance ABV

✓ Monthly ABV runs (January to June, 2018)

✓ Development of Gestation Length ABV

✓ Development of updated Calving Ease ABV

"We can send a man to the moon but we can't control the weather, so we need to do everything possible to make things better for the cows, which includes breeding cows with good heat tolerance."

Ian Scott,
Nanango, Qld.

Ian Scott

Highlights 2017/18

Balanced Performance Index

The Balanced Performance Index (BPI), released in 2016, is rapidly becoming the preferred index of genetic merit used by Australian dairy farmers. An analysis of readily-available Australian bull catalogues and advertising published after the April ABV release found that all but one company now includes BPI and ABVs in their promotional material.

There is also an emerging trend for the highest group of BPI bulls to attract a premium price. An analysis of the recommended retail prices for more than 500 Holstein bulls found that elite bulls (BPI >300) had an average price of $31/straw (Table 1). The remaining bulls had an average price of $27/straw, regardless of BPI. It should be noted, however, that the higher BPI bulls don't always cost more. Even among the top 100 BPI bulls, the price ranged from $14 to $150 a straw.

These trends indicate the Balanced Performance Index (BPI), Health Weighted Index (HWI) and Type Weighted Index (TWI) are well placed to meet industry needs until the next review of national breeding objective, which determines the weightings of traits in the three indices. This review is scheduled for 2019, with implementation in 2020.

Table 1: Recommended retail price of Holstein bulls based on BPI

BPI	Average retail price ($/straw)	Retail price range ($/straw)	Number of bulls
>300	31	18–150	56
250–300	27	14–50	114
200–250	26	12–100	168
170–200	27	12–90	97
<170*	27	12–80	116
Total	28	12–150	551

BPI below Good Bulls criteria.

Strategic priority 2: Software and data services

DataGene provides software and data services to both internal and external clients. These services are designed to enable farmers and service providers to make better, more timely management decisions. DataGene is focussed on:

- Building and maintaining data systems infrastructure.
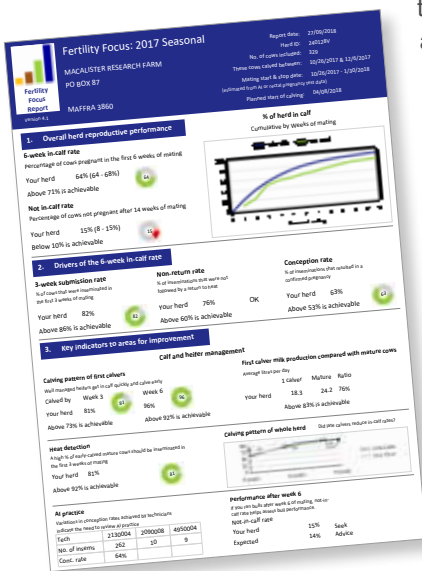- Developing and maintaining industry solutions.

Tools for easier decisions

The Genetic Futures Report is a new interactive tool that has been developed for delivery through the Central Data Repository, which will become operational in 2018/19. This tool is an evolution of the existing Genetic Progress Report. Whereas the Genetic Progress Report tracks historical genetic gain and shows the impact of breeding decisions, the new Genetic Futures Report has the additional functionality of estimating the impact of future scenarios. It also allows the user to customise their report to display their priority traits and indices.
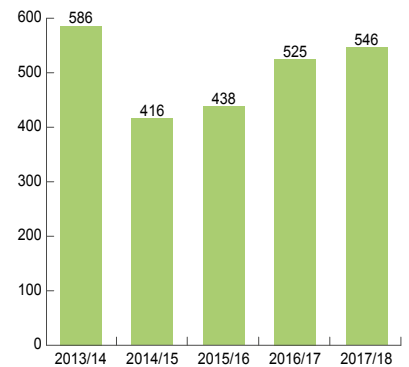
Dairy Australia has commissioned DataGene to revise the Fertility Focus Report so that it can be delivered through the Central Data Repository once it becomes operational. Offering the report through this platform will enable it to draw upon data from various sources, such as herd test centres and vet practices, resulting in a more meaningful reflection of the herd's fertility status.
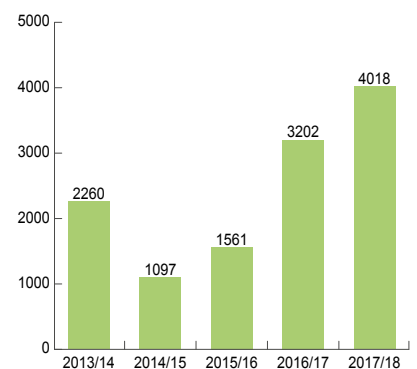
Uptake of the HerdData app continues to grow, with an updated version released in August. The new version makes it easier to register a herd. Future updates are in development.
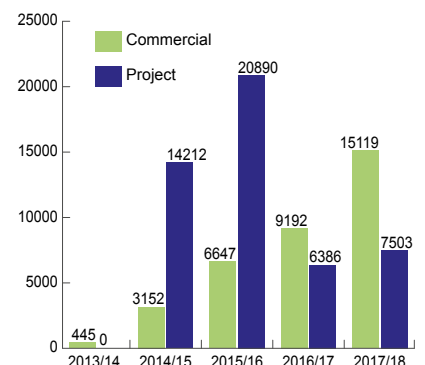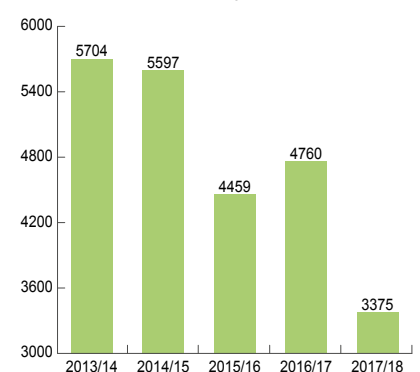
Genetic evaluation services

DataGene provides a range of direct genetic services to herd improvement companies including:

- Bull registration on the National Artificial Breeding Sire Identification Scheme (NASIS)
- Genomic testing
- Preliminary Breeding Values
- Daughter progress reports
- Workability scores

The use of genomic testing by the Australian dairy industry continues to grow. This year saw a 64% increase in cow genomic testing and a 25% increase in the level of bull genomic testing. While genomic results are of direct use to farmers and bull companies, this information also enters DataGene's genetic evaluation system, which results in more reliable Australian Breeding Values.

Number of NASIS-registered bulls

Year	Value
2013/14	586
2014/15	416
2015/16	438
2016/17	525
2017/18	546

Number of genomically-tested bulls

Year	Value
2013/14	2260
2014/15	1097
2015/16	1561
2016/17	3202
2017/18	4018

Number of genomically-tested cows

Year	Commercial	Project
2013/14	445	0
2014/15	3152	14212
2015/16	6647	20890
2016/17	9192	6386
2017/18	15119	7503

Workability data

Year	Value
2013/14	5704
2014/15	5597
2015/16	4459
2016/17	4760
2017/18	3375

Data systems

DataGene currently has two major data systems infrastructure projects under way: the genetic evaluation system new platform (GESNP) and the Central Data Repository (CDR). Funded by Dairy Australia, these two multi-year projects will bring transformational change to the herd improvement industry.
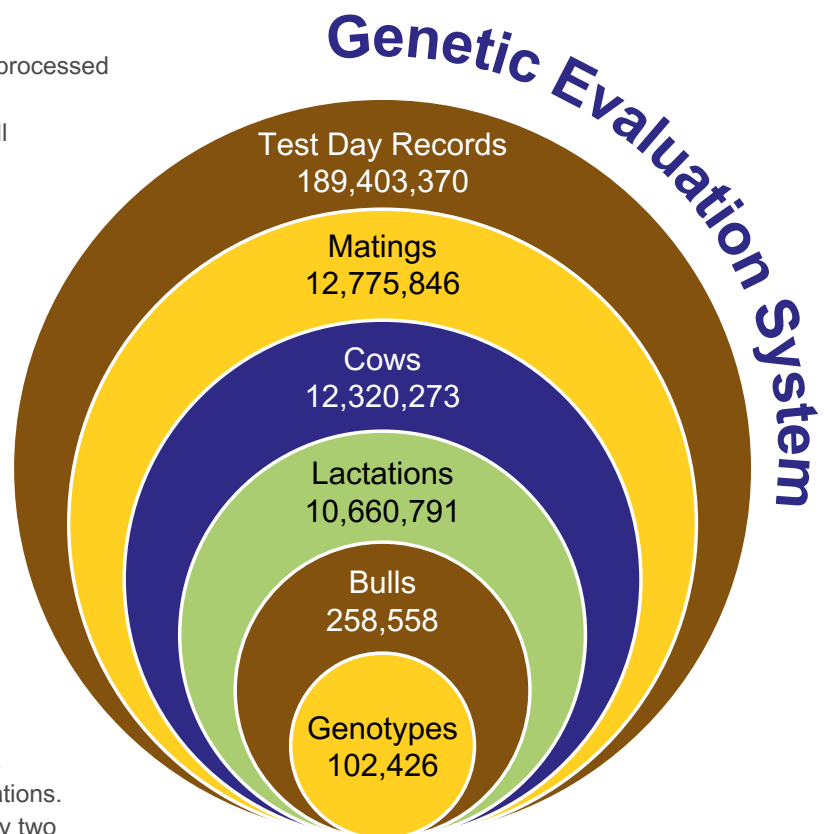
With most of the software rewriting of GESNP completed, the project is now in the testing and integration phase. Predictions calculated during the testing phase showed that breeding values generated by the new system are as good, or better, at estimating the genetic merit of animals for all traits. The testing process has been more time consuming than expected, due to the complexity of the system and the challenges associated with integrating the various modules to work together smoothly. Once operational, the new system will be immensely more efficient, have much greater functionality and the ability to process far more data than the current system.

The diagram shows the vast amount of data now processed by our genetic evaluation system, which was last updated about 20 years ago. DataGene clients will welcome the shorter processing time between supplying samples for genotyping and receiving the results. The new system will also provide bull companies with greater power and efficiency to analyse data.

Once operational, the Central Data Repository (CDR) will be made up of three components:

- Data from herds, industry organisations and various software programs.
- An IT platform that transfers data between systems.
- A web-portal (i.e. DataVat) that provides tools and reports utilising this shared data.

A major challenge of the CDR is creating an IT platform that connects data sitting across different organisations, software systems and physical locations. This IT platform has been developed and tested by two industry data suppliers. Further enhancements are currently under development to ensure the product is user-friendly and robust before it is released to the industry. Development of the web-portal is also under way. It will become the home of tools such as the Genetic Futures Report, Fertility Focus Report and Genetic evaluation reports. Dairy farmers will have control over who can access their different sets of data. For example, they may give authority for staff, their vet or advisor to access the herd's Fertility Focus Report.

Genetic Evaluation System

Test Day Records
189,403,370

Matings
12,775,846

Cows
12,320,273

Lactations
10,660,791

Bulls
258,558

Genotypes
102,426

Key deliverables

✓ Genetic Futures Report

✓ Fertility Focus Report

✓ Development of genetic evaluation system new platform (GESNP)

✓ Development of Central Data Repository

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Strategic Priority 3: Service Culture and Collaboration

This priority underpins the delivery of DataGene's services to industry (Strategic Priorities 1 and 2). DataGene is focussed on:

- Developing and maintaining internal systems and controls
- Developing a high-performing team
- Communicating with stakeholders

A variety of formal and informal mechanisms give stakeholders influence over DataGene's priorities. Formal governance structures include the Board, Standing Committees and User Groups (refer to pages 18 to 22).

We are increasingly working with Dairy Australia's Regional Development Programs to deliver extension activities that are both timely and relevant to local needs. These relationships are very important as we work to embed the value of genetics and herd recording into other key focus areas, such as farm business management, health and fertility.
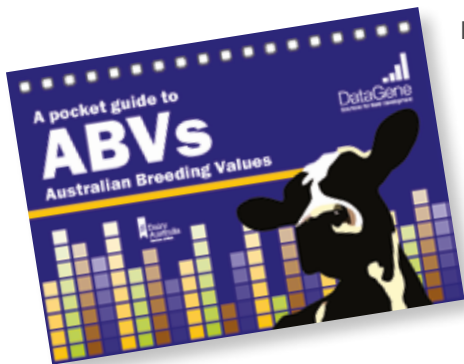
DataGene's main communication and extension activities are designed to encourage the use of Australian Breeding Values and Indices, to promote the use of herd recording and data collection and to support the use of DataGene products and tools by farmers and the herd improvement industry.

DataGene utilises a variety of media to keep farmers and stakeholders informed about activities. In addition to a regular page in the *Australian Dairyfarmer* magazine, DataGene sends regular electronic newsletters to targeted audiences, such as GeneMail (for the herd improvement industry), Ginfo e-update (for participating herds) and stakeholder updates for industry projects (e.g. ImProving Herds and MIR for Profit). DataGene also produces a range of information resources, including the Good Bulls Guide, tech notes and fact sheets. During the year, the ever-popular ABV Pocket Guide was updated, reprinted and distributed throughout the herd improvement sector.

DataGene is playing a lead role in establishing Dairy House, a joint office within the AgriBio building at La Trobe University. Scheduled for completion in late 2018, Dairy House will bring together DataGene, Holstein Australia, Jersey Australia and the National Herd Improvement Association (NHIA). We will be in the building where a significant proportion of dairy genetics research is undertaken, particularly animal and pasture genetics. The close collaboration will enable us to be more efficient in delivering services and sharing back-office functions. The Gardiner Dairy Foundation has been a generous contributor to the foundation of Dairy House.

DataGene has been instrumental in establishing Dairy House in the AgriBio building at La Trobe University.

Key deliverables

✓ Collaboration to deliver ImProving Herds and MIR for Profit

✓ Communication through Genemail and project updates

✓ Standing Committee interaction and input

✓ Update of ABV pocket guide

Industry projects

DataGene manages specific projects on behalf of industry. In 2017/18, it helped to manage three industry projects: ImProving Herds, MIR for Profit and Ginfo.

ImProving Herds

ImProving Herds was a collaborative project that aims to turn complex science into simple, data-driven messages for farmers. Funded by the Gardiner Dairy Foundation, Dairy Australia and the NHIA, ImProving Herds investigated four topics:

1. The financial contribution of genetics to dairy businesses.
2. The value of genotyping heifers to dairy businesses.
3. The value of herd testing to dairy businesses.
4. The contribution of genetics to reducing dairy's environmental footprint.

At the core of the ImProving Herds project were 34 focus farms, who willingly shared their herd and financial records with the project team. We are immensely grateful for the time and generosity of these participants, who gave us new insights into herd improvement at the grass roots. Collaborating organisations included DataGene, Holstein Australia and the National Herd Improvement Association of Australia (NHIA) and the Victorian Government.

Contribution of genetics

ImProving Herds showed that making decisions based on Australian Breeding Values (ABVs) and data pays. Compared to their herd contemporaries, cows with a high Balanced Performance Index (BPI) have higher margins over feed and herd costs. On average, the top 25% of cows (based on BPI) contributed $300/cow/year more income after feed and herd costs than the bottom 25%. The analysis drew upon more than 10 years of financial and herd data involving 7,700 lactations from 2,600 cows. The top 25% of cows produced 88 kg more milk solids per cow per year and lasted eight months longer. The additional feed demands of high BPI cows were easily recouped through additional milk income.

Genotyping heifers

Genotyping of heifer calves is increasing in popularity in many countries as a tool to:

• Help choose replacements based on ABV(g)s.
• Improve mating decisions by using high value (sexed) semen for selected animals.
• Reduce errors in parentage assignment.

The ImProving Herds project evaluated the relationship between pre-calving ABV(g)s and first lactation production records in the Genetic Focus Farms. The results showed that there was a strong relationship between ABV(g)s and production records. In fact, the relationship is very similar to published national mean reliabilities for equivalent traits. After accounting for the cost of genotyping, the benefit of picking the top 50% of replacements based on genomic BPI was typically worth about $40/head more than using parent average.

Industry projects

Herd testing

Seven Herd Test Focus Farmers went under the microscope for herd-testing and shared their experiences with the ImProving Herds team. Six of the seven decided to continue herd-testing after the project was complete. All used the herd-test information in decision making, with four saying that herd-test data was especially valuable to help them respond to high pressure events. The seventh farm recommenced herd testing shortly afterwards, with its owners missing the availability of data for decision making.

Environmental footprint

The ImProving Herds team assessed the impact of genetic improvement of dairy cattle on the environment. Selecting for high BPI leads to a reduction in greenhouse gas emissions because high BPI cows are more efficient producers and live longer, which leads to lower greenhouse gas emissions per unit of milk produced. Even though greenhouse gas emissions per cow are increasing as milk production and feed intake increases, the rate of increase is slower for BPI than its predecessor Australian Profit Ranking (APR), which is partly attributable to having the Feed Saved ABV included in the BPI.

Key findings

- ✓ The daughters of highly ranked Balanced Performance Index (BPI) bulls perform better under Australian conditions, across dairying regions and feeding systems.
- ✓ The top 25% BPI cows in a herd contribute on average an extra $300/cow/year income after feed and herd costs, are more fertile and last longer.
- ✓ The performance of genotyped heifers aligns with their genomic breeding values, confirming the benefits of using genomic breeding values to guide heifer selection decisions.
- ✓ Herd testing paid dividends through better culling choices, smarter feed allocation, improved management of sub-clinical mastitis and other herd decisions. It provides important data for responding to high pressure events, such as drought and milk price changes.
- ✓ Selecting for high BPI leads to a reduction in greenhouse gas emissions.

ImProving Herds found that cows in the top 25% for the BPI in a herd contributed on average an extra $300/cow/year income after feed and herd costs.

Industry projects

National Muster

The National Muster was a large-scale field day conducted at Jelbart Dairy, Leongatha South, Victoria on 8 May 2018. Jelbart Dairy is an ImProving Herd Genetic Focus Farm, thereby providing a powerful opportunity to convey the project's key messages through the eyes of participating farmers.

The event, which was attended by more than 300 farmers and service providers, was widely covered by state and national media. It drew an overwhelmingly positive response from participants and saw genetics become a key conversation topic in the industry.

The ImProving Herds project and National Muster have helped to rekindle interest in genetics beyond the usual circle of herd improvement enthusiasts. Delivery of the National Muster was a collaborative effort, involving the ImProving Herds project members, DataGene extension team and GippsDairy.

DataGene's extension program will continue to build upon this foundation and the resources developed by the ImProving Herds project. The Muster concept will be used to deliver mini-field days on other ImProving Herds Focus Farms, in collaboration with Regional Development Programs and the local herd improvement industry.

MIR for Profit

Mid-infra red (MIR) spectrometry involves passing a beam of light through a milk sample to provide data (spectra). This data has the potential to be widely used to understand more about a cow from a single milk sample. Overseas research shows MIR technology can be used to predict cow fertility, health, energy balance, methane emissions and feed efficiency.

In Australia, this information could be useful at two levels:

- For farmers and advisors: to provide greater insight from herd test samples about the current status of the herd and individual cows; for example, animals at risk of sub-clinical ketosis.
- For the herd improvement industry: to develop ABVs for new traits, such as health, and to improve the accuracy of some existing ABVs.

MIR for Profit was a three-year project that investigated opportunities for the application of MIR technology by the Australian dairy industry. To develop prediction equations for Australian conditions, the team undertook intensive data collection from Agriculture Victoria's Ellinbank research herd. This was supplemented by data from more than 12,000 cows in commercial herds in Victoria, NSW, South Australia and Tasmania.

Data was collected through herd test samples, DNA testing (genotypes) and animal performance measures, such as fertility, feed intake, body weight, body condition and methane emissions. PhD student, Tim Luke, collected blood samples from early lactation cows in commercial herds, which was evaluated for health indicators such as energy status, ketosis, hypocalcaemia, urea and proteins. By matching actual performance data with MIR spectra, the team was able to develop prediction equations for Australian conditions.

The project demonstrated that MIR analysis of milk samples can be used to predict energy balance in Australian dairy cattle. A follow-up project, MIR for Health, is now under way to further validate the prediction equations.

MIR for Profit was funded by the Australian Government Department of Agriculture and Water Resources as part of its Rural R&D for Profit program. The project was a collaboration of DataGene, Agriculture Victoria, Dairy Australia and the National Herd Improvement Association of Australia (NHIA).

MIR technology offers the opportunity to understand a lot more about a cow from a single milk sample.

Industry projects

Ginfo

Ginfo is Australia's national reference herd for genetic information. Managed by DataGene and funded by Dairy Australia, Ginfo is a large-scale genotyping project that provides genetic and performance information to increase the reliability of Australian Breeding Values (ABVs) and indices.

The reference population includes almost 100 commercial dairy herds with excellent records. They are located across Australia's eight dairying regions and include Holstein, Jersey and Australian Red herds. Ginfo includes detailed information on more than 30,000 cows including their genotypes, classification scores and performance data from herd testing.

Ginfo data has made it possible to develop genomic breeding values for traits that are difficult to measure, such as Heat Tolerance and Feed Saved. The data also contributes to improvements in the reliability of the ABVs and indices, particularly Daughter Fertility ABVs. DairyBio researchers are currently using Ginfo data to develop breeding values for health, with a Mastitis ABV scheduled for release in 2019.

In May 2018, DataGene held a conference for herds participating in Ginfo. More than 80 people, representing 35 herds attended the day. Delegates received updates on how their data is being used in the genetic evaluation system, new breeding values under development and customised reports based on their own herd's data.

DataGene manages the on-going maintenance of the national reference herd with Holstein Australia providing field support in collecting DNA samples and classifying animals. Over the next couple of years, DataGene plans to double the number of Ginfo herds to 200. To qualify, farms need to have kept detailed herd records over a number of years.

Ginfo is a collaboration of DairyBio, DataGene, Dairy Australia, Holstein Australia, Jersey Australia and the Victorian Government.

The first Ginfo conference was held in May 2018 to update participating herds on how their records contribute to the genetic evaluation system, particularly new genomic breeding values, such as the Heat Tolerance ABV.

DataGene Board

DataGene is governed by a skills-based board. Members are elected on their knowledge and experience in dairy, herd improvement, finance and governance. The board must include three directors with direct expertise in dairy farm management. Directors are entitled to serve a three-year term and up to three consecutive terms (i.e. nine years). The ongoing rotation of Directors ensures the ongoing refreshment of skills and experience on the board.

Ross Joblin

LLB (Hons), Dip Corporate Management, FAICD, FCIS
Dairy Australia-nominated Director and Chair

Ross Joblin was a member of Dairy Australia's senior management team from 2010 to 2017. As Group Manager Business Operations, he was responsible for strategic planning, finance, issues management, corporate communications, human resources, IT and legal affairs. Prior to joining Dairy Australia, Ross held a range of roles as a corporate lawyer and senior manager in listed public companies. He has a broad range of commercial experiences in operations management, corporate strategy, mergers, acquisitions, start-ups and human resources. Ross has also worked with a number of industry boards in the areas of board governance and effectiveness.

John Harlock

FAICD
ADF-nominated Director (resigned, 29 June 2018)

John and his wife Shirley own and operate a 400-head dairy farm in Warrnambool, Victoria. As both a dairy farmer and the former chairman of Genetics Australia, John has a sound understanding of the herd improvement industry and the benefits which can be derived from improved genetics. John has served on numerous dairy industry boards and committees including Warrnambool Cheese & Butter Company, Western Herd Improvement, Warrnambool Co-operative Society and the United Dairyfarmers of Victoria.

Postscript: The DataGene board and staff were saddened by the passing of John Harlock on 15 July, 2018 (refer to page 23).

Graeme Gillan

NHIA-nominated Director

Graeme Gillan is chair of the National Herd Improvement Association of Australia (NHIA) and CEO of Holstein Australia. His involvement with dairy herd improvement spans more than 45 years working with several leading Australian genetics companies. Over this time Graeme has been involved at the coal face of herd improvement innovations including expanding the sources of genetics, the introduction of computerised mating programs and increasing the gene pool of the Jersey breed in the 1990s, overseas investment in Australian genetics in the 2000s and the promotion of genomics since 2010. He is passionate about the industry's role in influencing priorities for research, development and extension programs, to ensure herd improvement continues to deliver value to Australian dairy farm businesses.

Lucinda Corrigan

BScAg(Hons), FAICD
Director

Lucinda and her husband run 3,500 performance-recorded Angus cattle based at 'Rennylea' in the NSW Murray Valley near Albury. Over the past 30 years, they have developed one of Australia's leading genetics businesses via the dedicated use of Breedplan for genetic improvement and a highly accurate database of phenotypes and genotypes. Lucinda has lengthy experience in governance, business management, marketing, research and innovation via executive roles within the textile industry and as a director with the Graham Centre for Agricultural Innovation, four Cooperative Research Centres and Meat & Livestock Australia. In 2007, Lucinda received the Helen Newton Turner Medal from the Association for the Advancement of Animal Breeding and Genetics in recognition for her contribution to animal breeding and genetics.

Simone Jolliffe

BRurSc, AICD
Director

Raised on a beef property and completing a Bachelor of Rural Science, Simone had a lifelong interest in in animals, genetics and their production potential long before she joined her husband in the dairy industry. Together they milk about 250 cows near Wagga Wagga in NSW. Simone has held a range of industry roles at the local, state and national level over many years. They include the Australian Dairyfarmers and Dairy NSW boards and the NSW Primary Industry Minister's Advisory Council. She has also been actively involved in local Holstein Australia committees and a variety of community organisations.

Craig Lister

BBusMan(AgMan)
Director

Craig Lister is a dairy farmer and Holstein breeder from Calivil, Northern Victoria. Craig was Chair of the ImProving Herds project steering committee and a former director of Murray Dairy and Chair of the Murray Dairy industry steering group. Craig has very strong financial analysis, data interpretation and strategic planning skills. He holds a Bachelor of Business (Agricultural Management), backed up by experience in agricultural consulting, industry research and development projects and his own farm business. Craig is an advocate for the on-farm application of genetic evaluation and livestock improvement technologies. His herd currently ranks in the top 10 in Australia for Balanced Performance Index (BPI), the genetic merit index for profit.

James Smallwood

BAgSc
Director

James is General Manager of ABS Australia, one of the leading suppliers of genetics to the Australian dairy industry. Before joining ABS in 2013, James and his wife owned and operated dairy farms in New Zealand. He also continues to perform consultancy roles off-farm. Graduating with a Bachelor of Agricultural Science from Massey University in New Zealand, James has lengthy experience in international agribusiness, management and farm management via roles with Promar International and Meat & Wool New Zealand.

DataGene Standing Committees

DataGene's standing committees enable members to have direct influence over DataGene's priorities and program activities. These committees are not simply advisory bodies, but exercise authority as delegated by the Board in areas of industry policy and guidelines.

These committees comprise individuals from within the dairy industry and herd improvement sector who possess relevant skills and experiences. Standing Committee members are nominated by stakeholders and appointed by the Board. Each Standing Committee is chaired by a member of the DataGene Board and includes at least one member of the DataGene management team. A member of the Board chairs each standing committee.

Genetic Evaluation Standing Committee

The Genetic Evaluation Standing Committee provides advice and recommendations to the DataGene Board on specialist matters in relation to genetic evaluation and related technologies.

Committee members include:
- Simone Jolliffe (DataGene Board and Committee Chair)
- Rohan Butler (Holstein Australia)
- Jo Dickson (Farmer representative)
- Patrick Glass (Australian Dairyfarmers representative)
- Christian Hickey (National Herd Development – NHD)
- Tim Humphris (Farmer representative)
- Vaughn Johnston (Semex)
- Jennie Pryce (Agriculture Victoria)
- Gert Nieuwhof (DataGene)
- Bruce Ronalds (ABS Australia)
- Rohan Sprunt (Jersey Australia)
- Trevor Saunders (Farmer representative)
- Peter Thurn (Genetics Australia)
- Dairy Australia representative
- DataGene staff

The Genetic Evaluation Standing Committee met three times during 2017/18. The committee received regular progress updates and provided feedback on the genetic evaluation system new platform (GESNP), the central data repository (CDR) and scientific issues, such as genetic trends, breeding values under development and industry projects.

In addition to making technical decisions about the details of specific ABVs, policy decisions by the committee during the year included:
- Public release of the Heat Tolerance ABV in December 2017.
- An industry genetic gain target for bulls of $40 BPI/year and $20 BPI/year for cows.
- Subsidised calf genomic testing for Ginfo herds.
- Printed copies of the Good Bulls Guide to be distributed upon request, rather than automatically to every Australian dairy farmer, which had previously been the case.

Reports from each meeting are distributed to stakeholders and are available on www.datagene.com.au.

DataGene Standing Committees

Data Services Standing Committee

The Data Services Standing Committee provides advice and recommendations to the DataGene Board on specialist matters in relation to opportunities for new tools and services that help farmers make data-driven decisions.

Committee members include:

- Craig Lister (DataGene Board and Committee Chair)
- Adele Beasley (Australian Dairyfarmers)
- Alan Blum (Yarram Herd Services)
- Nick Brasher (FarmWest)
- Heather Campbell (Farmer representative)
- David Chandler (Easy Dairy)
- Mike Huth (Genetics Australia)
- Lyn McGrath (National Herd Development)
- Stewart McRae (Hico Australia)
- Luke Morison (APIAM)
- Dairy Australia representative
- DataGene staff

The committee met in person once during the year with further communication via email and phone. The committee received progress updates and provided feedback on the genetic evaluation system new platform (GESNP), the central data repository (CDR) and the Data Governance Group. It provided technical input in relation to the Herd Test Dashboard, 24-hour milk yield calculations and connecting data sources to the CDR.

Herd Testing and Animal Recording Standing Committee

The Herd Testing and Animal Recording Standing Committee provides advice and recommendations to the DataGene Board on specialist matters regarding herd testing, animal recording and related issues. 2017/18 involved the preparatory work for the formation of the committee, with the first meeting taking place on 11 July 2018. This committee's role will be increasingly important as the central data repository (CDR) becomes operational.

User groups

User groups provide an additional level of industry consultation. Each informal group comprises a small number of active users on a specific DataGene software product or tool. Their role is to ensure a better alignment of resources to fulfil user needs and to identify and prioritise refinements and improvements to DataGene products. User Groups meet as required.

Data Governance Group

The Data Governance Group is a technical group that develops policies and processes for the use and sharing of data. This will be increasingly crucial as the central data repository becomes operational. The Data Governance Group also makes detailed technical decisions about the way data is handled, presented and disseminated to industry.

DataGene Standing Committees

Members of the Data Governance group include:

- David Beggs (Dairy Data)
- Julian Bentley (formerly with DairyKing)
- Nick Brasher (Farmwest)
- Rohan Butler (Holstein Australia)
- David Chandler (Easy Dairy)
- Sue Gow (Hico Australia)
- Tim Humphris (dairy farmer)
- John Leddin (SCR Dairy)
- Lyn McGrath (NHD)
- Peter Nish (Tasherd)
- Geoff Potts (Dairy Express)
- Bruce Ronalds (ABS)
- DataGene staff

This group collaborated via email but did not physically meet during 2017/18.

Vale John Harlock

The Australian dairy herd improvement community was saddened by the passing of DataGene foundation board member, John Harlock, in July, 2018. John was a staunch advocate for genetic improvement, Australian genetics and the herd improvement sector for more than 30 years.

Together with wife, Shirley, and son and daughter-in-law, Scott and Fleur, John operated a number of dairy farms over the years, including Wingara, Camperdown; Fala Park, Warrnambool; Kentucky, Yambuk; Parkview, Koroit; and more recently, beef and sheep properties in South Australia.

They were early adopters of herd testing, which soon led to John being elected onto the boards of Western Herd Improvement and Herd Improvement of Victoria (HIOV). He later served on the board of Genetics Australia for 15 years, including eight as chairman; the board of Australian Dairy Herd Improvement Scheme (ADHIS), for eight years, including three as chairman; and more recently, on the foundation board of DataGene.

Living by the motto, "If you are not involved, you are part of the problem," John worked tirelessly on numerous other industry associations and initiatives over the years. These included board positions with Warrnambool Cheese and Butter and Warrnambool Co-operative Society. He was a former branch president of United Dairyfarmers of Victoria (UDV) and President of the Herefords Australia SA regional group.

John had a deep love of the Australian dairy industry and its people. He was a generous mentor to young people in the dairy industry. Only a week before his death, John was inducted into the Western Victorian Dairy Industry Honour Board.

John leaves a lasting legacy through his outstanding contribution to the Australian dairy industry, his fellow farmers, his colleagues and his family. Our condolences to Shirley, Scott, Matt and the extended Harlock family.

John Harlock