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EVALUATING DAIRY HERD GENETIC PROGRESS

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SUMMARY

The Genetic Progress Report (Report) is an effective tool for farmers and their advisors to monitor genetic change at herd level, especially when gains are only slightly positive or even negative. Farmer case studies show a willingness to refine breeding objectives based on the report. An increased uptake of the Report is expected to contribute to a more focused approach to genetic choices and increased rates of genetic gain for both profit and traits of interest.

INTRODUCTION

For over 30 years, Australian farmers have steadily achieved genetic progress for Australian Profit Ranking (APR); an economic index that includes milk, fat, protein, survival, fertility, cell count, milking speed, temperament and liveweight traits. Currently, the rate of genetic gain for Holsteins is $8.40 profit/cow/year ($11.00 and $9.04 for Jersey and Red Breeds respectively) (ADHIS, 2014). However, progress could be more than double (Lacey and Coats, 2013).

While there are likely to be many factors contributing to slower than theoretically possible genetic gain, the time between making a choice and seeing the outcome is one element. In a 2012 survey, dairy advisors who don't work in herd improvement were asked to describe characteristics of genetics that were most off-putting. The commercial politics, hard to keep up to date, time to see change, science is complicated were all reported to be off-putting by 46%, 25%, 16% and 11% respectively (n=125) (ADHIS, 2011). The results emphasise the need for unbiased, current information that is easy to access. While these findings are specific to advisors, anecdotal feedback from farmer discussion groups suggests farmers have similar needs. Simple, clear information on genetic change over time and current genetic merit would be very helpful. Furthermore such information would reinforce to farmers the permanent and cumulative nature of genetics and the need to make good choices each breeding season. The purpose of this paper is to explore the current use of a new report focussed on these aims by farmers and their advisors.

DESCRIBING AND USING THE GENETIC PROGRESS REPORT

To help farmers and advisors measure and monitor the effectiveness of their breeding choices, ADHIS developed the Genetic Progress Report. The Report is a within-breed analysis of a herd over a ten year period and shows genetic gain for APR, protein kilograms, fat kilograms, overall type, survival, daughter fertility and cell count. Over a decade's worth of herd genetic information is displayed in an easy-to-read, two page report. Parameters of the report are defined in Table 1.

The Report was first launched in April 2013 and has been released twice yearly since that time (April and August). The Report is provided to farmers, upon request, from their herd recording centre and is mailed to farmers on an annual basis.

In 2014, Australia had a total of 6,314 dairy herds with 3,023 (48%) herd recording. Of those, 2,481 herds met the minimum data requirements of the Report in August 2014. The proportion of total reports by breed was 82% Holstein (or Holstein cross), 15% Jersey (or Jersey cross), 3% other breeds. Each of the 2,481 herds will have a different Report and reactions to the report will vary. The following case studies provide an overview of two approaches.

Table 1. Definitions of parameters included in the Genetic Progress Report

ABV	Australian Breeding Value, Equivalent to EBV. ABVs for protein kg, fat kg, overall type, survival, daughter fertility and cell count are reported
APR	Australian Profit Ranking, Australia's economic index prior to March 2015.
Average APR	Average APR of current cows in the herd.
Average of top 10%	The average APR of cows in herds ranked within the top 10% of the breed by year of birth.
Breed	Purebred and non-purebred are considered side by side, but other breeds separately.
Current cows	Cows calved in the past 30 months (relative to release date) and contributed data to an ABV.
Genetic trend for each trait and index	Increased = Average APR or ABV of years 6-10 > Average of years 1-5 and the last APR or ABV > first APR or ABV Decreased = Average APR or ABV of years 6-10 < Average of years 1-5 and the last APR or ABV < first APR or ABV No clear trend = if either of the above statements are not true
GBG	Percentage of cows with sires included in the Good Bulls Guide or Progeny Test near the time of their dam's mating.
Minimum data requirement	At least 50 cows of a single breed with ABVs. Dates of birth occur over several years.
National Average	The average APR or ABV of cows of the same breed and year of birth.
Rank	Rank within breed. Sorted by APR then ASI.

In April 2015 ADHIS launched three new breeding indices. As a result the GBG has been updated replacing the APR with the new economic index, Balanced Performance Index (BPI). The Health Weighted Index (HWI) and Type Weighted Index (TWI) are also included.

Case Study 1 – Chris and Diana Place. Finding out their Holstein herd ranked in the top 100 for APR was a welcome surprise to Chris and Diana Place, but they were more interested to see opportunities to improve fertility and mastitis resistance through breeding. These are just some of the results from the herd's Genetic Progress Report. Chris dairies with his wife, Diana and his brother Peter, in Western Victoria. Their 420 cow Holstein herd averages more than 285 kg fat and 235 kg protein from a predominantly grass-based feeding system, 5% above the regional average of herd recorded cows (ADHIS, 2014).

Breeding decisions have always focused on high production cows that are easy to milk and have few health and fertility problems. For many years Chris has selected bulls from the top of the list for APR and within that list, bulls that are positive for udders, feet and legs. Their Report, of which sections are shown in Figure 1, shows how much has been achieved with this consistent approach. While it's reassuring to see how much can be achieved through breeding, Chris was more interested in the sections of the Report that showed opportunities for improvement. Figure 1 showed that genetic progress for fertility is declining so Chris immediately gave higher priority in his selection decisions.

When it comes to selecting sires for the season, Chris normally uses the Good Bulls Guide. His strategy is to go straight to the top four or five APR bulls in the Guide and then check them for the individual traits that are important for his herd. So from now on, he plans to look at fertility and mastitis resistance as well udders, feet and legs. 'The Report presents our herd data in a very useful format. It's a great tool to help us with our breeding decisions.'

Figure 1. Genetic Progress Report Place herd (Protein kg, Fat kg, Cell count and Fertility)

Case Study 2 – Bettina and John McLeod. Bettina and John McLeod's herd ranks in the top 150 for profit among Holsteins as shown in Figure 2 but the McLeods do not spend hours studying bull catalogues. Their achievement of a high genetic merit herd has come through a successful partnership with their breeding advisor, Mr Graeme Heaver.

The McLeods dairy in South-West Victoria. Their 400 cow herd averages 770kg milk solids/cow, 56% greater than the regional average (ADHIS, 2014). A couple of times a year Mrs McLeod and Mr Heaver discuss the herd's breeding objective, progress towards that objective, and specific priorities for the coming joining season.

The Report has been useful in fine tuning the McLeod's selection criteria. "The report highlighted how much progress has been made for cell count in recent years. Satisfied with this result, Bettina and I decided to place higher priority on selecting for fertility within the top sires" Mr Heaver said.

Mrs McLeod finds the Report particularly useful for identifying and learning from past mistakes. "When I look at the graphs, I'm interested to see the dips – because they show where we made a mistake." For example in 2006, another breeding advisor chose the sires, purely for type

without consideration of other traits. While the report shows a subsequent peak in genetic progress for type, it was accompanied by dips in profit, fat, protein, fertility, and longevity. Mrs McLeod is keen to be continually improving their dairy operation and uses the Report as a tool for monitoring breeding progress. "The Report presents our data in graphs that make it easy to see long term trends," she said.

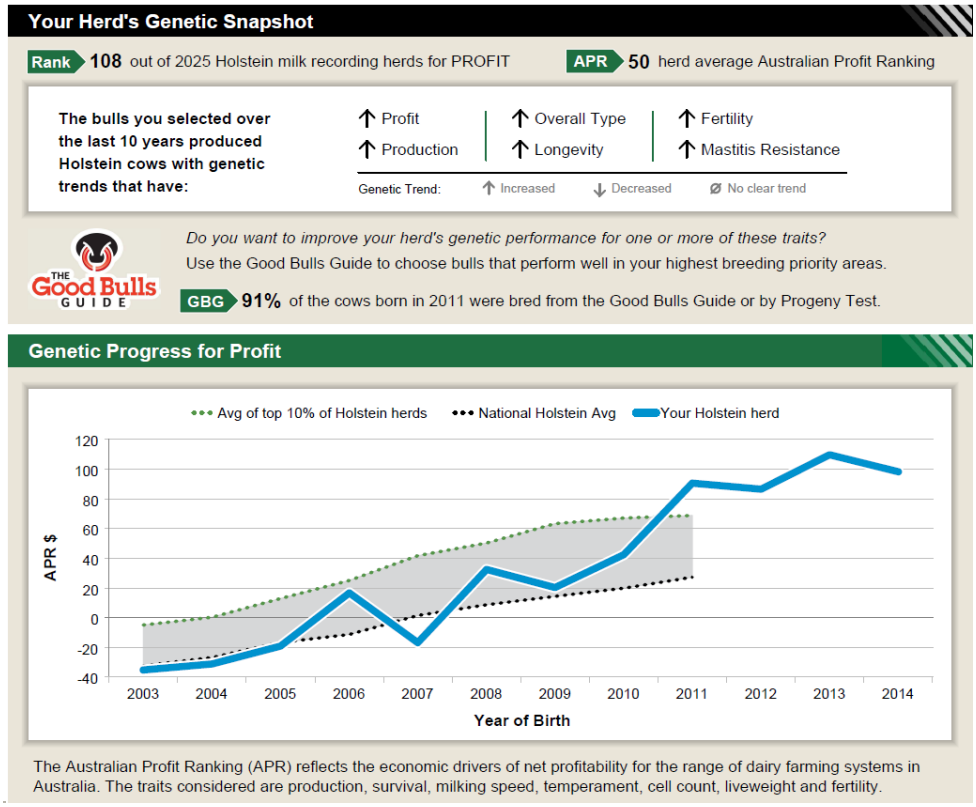

Figure 2. Genetic Progress Report for John and Bettina McLeod's herd (Profit)

CONCLUSIONS

The Genetic Progress Report is a practical output of ADHIS and Dairy Australia's investment in genetic evaluation, genomic technology and genetics extension. Its value in identifying success and opportunities for improvement is shared amongst farmers and their professional advisors. Further work is scheduled to comprehensively evaluate the success of the Report. Updates to the report to incorporate Australia's new breeding indices will further enhance opportunities to use this Report in genetics extension and education activities.

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