Profitable dairy farming: Using genomics to increase profit and reduce emissions

Over 50 per cent of dairy farm emissions come from cows burping methane. For the dairy industry to achieve a reduction in emissions intensity, every cow needs to be efficiently producing milk.

Unproductive animals cost money, emit greenhouse gases and produce less milk. The more of them there are on your farm as a proportion of the total herd, the more emissions intensive your operation is. Conversely, the most productive cows produce the most milk per unit of feed, make the most money and produce the least emissions per kilogram of milk solids.

There are potentially significant gains to be made with improved herd genetics. Breeding more efficient herds can help reduce greenhouse gas emissions intensity.

**Animals bred for feed conversion efficiency will be less emissions-intensive**
More feed-efficient animals will use a greater proportion of their diet for milk production, reducing the amount that is excreted as either methane or nitrous oxide. In the near future it will be possible to select bulls on the basis of their feed conversion efficiency which will mean better feed utilisation, fewer inputs, less waste and higher production per unit of input.

Breeding to reduce emissions intensity offers a more permanent and cumulative option than most other management strategies, and should be cost-effective in most systems.

**Improved fertility will reduce emissions intensity**
Improving your herd's fertility via breeding or nutrition will result in greater lifetime production per cow and fewer replacements, both of which will increase farm profitability and reduce emissions intensity.

Good transition cow management is a key element of this, as management during this period will affect both herd fertility and milk production, replacement rates and cow health.

**Extended longevity will reduce emissions intensity**
By increasing the age at which mature cows are culled you reduce the proportion of their lifespan that is unproductive. This results in lower emissions intensity.

Greater longevity also means that fewer replacements are required to maintain herd size and milk production. Heifer replacements produce emissions but not milk, so having a lower proportion of them in your herd also reduces farm emissions intensity and the costs associated with feeding and maintaining unproductive stock.

**Herd improvement makes good business sense**
Managing herds to reduce unproductive animals and number of unproductive days makes good business sense from both emissions and profitability perspectives. Farmers should first and foremost consider the productivity and profitability impacts of potential emissions reduction strategies. A range of practical options is available for improving cow longevity, fertility and health – good for productivity, profitability and reducing emissions intensity.

**Genomics technology for herd improvement**
The data now collected and analysed to help farmers to improve their herds is massive: 6.2+ million cows; 10+ million lactation records; 360 000+ bulls; 13+ million animals.
And breeding cows from higher genetic merit sires is proven to increase production, regardless of your feeding system: production increases, protein increases, longevity is the same or longer than lower genetic merit animals.

So, regardless of your feeding system or current milk production level, use better bulls!

**What's the process?**

1. Identify, genotype and select calves
2. Review your Genetic Progress Report
3. Use the ADHIS (Australian Dairy Herd Improvement Scheme) Good Bulls app or guide to select bulls
4. Use enough semen or sexed semen.

This process is an ongoing cycle of herd improvement. It doesn’t cost much, it doesn’t take a huge amount of time and the benefits are significant in terms of productivity, profitability and reducing emissions intensity.

The Genetic Progress Report helps you identify where your herd is headed for key traits and once areas for improvement are identified, the Good Bulls guide and app help you choose appropriate bulls. You can select with a focus on your preferred index: Balanced Performance, Health Weighted or Type Weighted.

The Good Bulls guide includes bulls that are actively being marketed in Australia, meet minimum reliability requirements for their breed, and are amongst the best in their breed on the Balanced Performance Index.

**Genomics in practice**

Gary Zweck, who operates a TMR system near Blyth, is a participant in the ImProving herds project, which is examining how genetics is currently contributing to herd profitability and how new tools can be integrated into farm management decisions.

ImProving Herds is an innovative and collaborative herd improvement research, development, extension and education project. It is a Gardiner Foundation project led by the Department of Economic Development, Jobs, Transport and Resource and supported by Dairy Australia, Australian Dairy Herd Improvement Scheme, National Herd Improvement Association and Holstein Australia, with a wide range of industry collaborators.

Gary became interested in genomics after hearing Brian Houin of Homestead Dairy, Indiana USA discuss at DairySA Innovation Day 2015 how he uses the technology in his herd. When Gary heard about the ImProving herds project he was keen to participate and successfully applied.

“I’m keen to understand where my herd is at now and how different cow families are performing,” he said.

He wants to use genomics to improve his herd as quickly as possible.

“I’d like to identify the bottom end of the herd and what impact they are having on profitability, and then target the top performers for future breeding,” he said.

“We also have a few cows that they we’ve bought in over time and I’d like to identify and compare their performance to our home-bred cows.”

Gary is also using his participation in the ImProving Herds project to better understand the ADHIS Good Bulls guide and how to apply it to his herd.

Through ImProving Herds, the Zwecks’ data is being generated by tail hair sampling heifers, with the 2014 drop sampled initially and a few others identified from first lactation.

**For more information, contact:**

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