The value of breeding for efficient feeding

Key points

- ✔ Gardiner funds ground-breaking research
- ✔ Use of genomic technology
- ✔ Link between efficiency and fertility

By **Alexandra de Blas**

THE Gardiner Dairy Foundation is thrilled to see the launch of the new Australian Breeding Value (ABV), called Feed Saved, that will help farmers produce cows that convert feed into milk more efficiently. It is a technology expected to benefit dairy producers to the value of $35 million across 25 years.

If the development of the Feed Saved ABV is traced — from research to the farmer's dairy — it shows a classic example of the type of investment the Gardiner Dairy Foundation likes to support.

Gardiner invested $2.3 million in three projects across five years. From 2008 it funded the research by the Dairy Futures Cooperative Research Centre and the Department of Economic Development, Jobs, Transport and Resources (DEDJTR) that unlocked the genomics that made the new ABV possible.

The project involved a large team led by Dr Ben Hayes from DEDJTR and much of the research for the new breeding value was undertaken by senior scientist Dr Jennie Pryce, also based at the DEDJTR.

Every cell in a cows body contains a full copy of its genome made up of 3 billion paired strands of DNA , like this, and 22,000 genes.

'There are bulls that can pull off the magic trick of being able to achieve better efficiency ... and are actually more fertile as well'.

"For the Gardiner Foundation to come to the party back in 2008 was really tremendous and a bold move in terms of the technology," Dr Pryce said.

"Back in 2001 a couple of my colleagues Ben Hayes and Michael Goddard, in collaboration with a colleague from overseas, developed genomic selection as a way to calculate breeding values using just a sample of DNA. By 2008 several countries were starting to implement genomic breeding values using this technology for traits that we already had breeding values for, such as milk production and fertility.

"However, we recognised that one of the real strengths of genomic selection was to take a trait that could only be measured on a small scale, on research farms, to a breeding value that all farmers could use."

Which is why Dr Pryce and her colleagues began a feed efficiency experiment with the view to bring together the genomic selection technology with data collected from individual cows in research stations.

Chief executive of the Gardiner Foundation Mary Harney said: "Gardiner has a strategic focus and is committed to invest in projects that foster innovation and improve the long-term future of the Victorian dairy industry. It is rewarding to see a project where strategic investment in research has led to such a tangible outcome — with direct benefits to the dairy industry and improved profitability for farmers over time."

Back to basics

It is useful to take a step back for a moment and do a refresh about how it all works.

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DNA or deoxyribonucleic acid is the chemical compound that contains the instructions needed to develop and direct the activities of nearly all living things. DNA molecules are made of two twisting, paired strands, referred to as a double helix.

A cow's complete set of DNA is called its genome. Virtually every single cell in a cow's body contains a full copy of the genome, which is made up of three billion paired strands of DNA and 22,000 genes.

The research

The Feed Saved ABV is based on research that investigates the efficiency with which a cow converts feed into milk. While selective breeding and improved nutrition has resulted in higher milk outputs in the past 50 years, information about feed efficiency has been limited. For example, two cows could weigh the same and produce the same amount of milk, but one may eat 10% less dry matter to achieve that result.

The researchers recorded the individual feed intake of about 1000 growing heifers and more than 350