



LambEx 2012 Conference Proceedings

Document ID:	SheepCRC_33_4
Title:	What Genomic Technologies means to Stud Breeders: Faster genetic gain and more control
Author:	Andrew Michael
Key words:	Genetics; genomics; genetic gain;

This paper was presented at the LambEx Conference held in 2012, as part of the Sheep CRC presentations. The paper should be cited as:

Andrew Michael (2012) – *What Genomic Technologies means to Stud Breeders; Faster genetic gain and more control*

What Genomic Technologies means to Stud Breeders: *Faster genetic gain and more control*

Andrew Michael¹,

¹*Leahcim Poll Merino and White Suffolk Stud*

The Michael family have been farming on the original farm at Snowtown for over 100 years with Noah and Hazel, our grandchildren, being 6th generation. Leahcim farms are located in three areas of South Australia, a station east of Burra (220mm rainfall), a mixed farming operation at Snowtown (375-420mm rainfall) and a grazing property at Keith in the south east (500mm rainfall). The balance of the three regions gives us diversity with stock management as well as seasonal security. Our cropping has been scaled back over recent years as we feel that the overheads and poor marketing options available make it a difficult and uncertain industry to be involved in.

The balance of our commercial and stud sheep operation has changed over the last 10 years, mainly because of poor seasons, plus Leahcim has had very strong demand for our high performance Poll Merino and White Suffolk genetics. We have mated 3000 stud ewes this year and we hope to pedigree record and measure approximately 80% of these to achieve ASBV's that have high accuracies to assist us and our clients to obtain maximum genetic gains. Ewe lambs are mated at 8 months of age with an average of 65% pregnant, and then lambing at 13 months of age. Some recent data analysis from pregnancy testing in previous year's showed ewe lambs that had a higher conception rate also had a higher Yearling Weight ASBV, plus they were genetically linked to certain sires with high reproduction rates.



Leahcim was one of the 18 foundation studs that helped develop the White Suffolk Breed which is now one of the largest terminal breeds in Australia. Our Poll Merino stud was established in 1983 using Gum Hill genetics for 9 years, and then our breeding direction changed with more emphasis being placed on skins and wool production. Dr Jim Watts started working with us in 1992. Our wool then was 24.7 micron with fleece weights averaging 7.2kg and a staple length of 97mm. In 1998 we started measuring all aspects of our Merino sheep, putting all of our data into MERINOSELECT for both carcase and wool, along with full pedigree information. With our White Suffolk's we had been using LAMBPLAN since it started and could see the merit in measuring the meat traits and the gains that had been made.

The same results are now very evident with our Poll Merinos with rapid gains in both meat and wool production. The use of ASBV data analysis is giving us the capability to increase our genetic gains and profitability at a rate that we didn't think was possible.

With the introduction of Genomics we are very confident that the sheep industry genetic gains can be further enhanced.

The genomic test for polled and horned animals will lead to significant financial savings plus easier management for Merino producers across the country.

This should be big news for commercial producers using a dominant poll gene, particularly those in the pastoral zones who have to transport their sheep long distances, because it will mean a reduction in bruising and damage to hides.

The DNA testing conducted as part of the Sheep CRC genomics research has helped us identify a line of young rams with the pure poll gene, as well as highly accurate breeding values to predict traits including fleece weight, micron, staple length, growth, muscle, carcase fat and intramuscular fat plus many more breeding traits.

The research breeding values (RBV) provided by the Sheep CRC's genomics research do not replace traditional breeding systems or ASBV technology, but it will assist us to breed the type of sheep we want much faster.

We first integrated genetic tools into our breeding program more than 25 years ago when we started performance recording our White Suffolk flock, and followed suit with our Poll Merino flock about 15 years ago. We have been using Australian Sheep Breeding Values (ASBVs) ever since.

ASBVs, which are administered by the industry's LAMBPLAN and MERINOSELECT programs, are used to compare the genetic potential of animals independent of their environment and location. They are based upon performance data from more than 1000 flocks around Australia.

Leahcim uses electronic tagging and the Pedigree Matchmaker system to match progeny and parents within breeding groups. The ewes are joined for 34 days, with the first group of ewes starting in mid-December, followed by an AI joining of stud ewes, and a final group being joined in late February to maximise the use of our Pedigree Matchmaker system.

Only the top 15 one and two year old stud Merino rams and just 5-6 White Suffolk rams are selected for the studs based on their ASBVs and now their DNA test results and associated genomic research breeding values. 15 Poll Merino ram lambs and 8 White Suffolk ram lambs with RBVs were used in our ewe lamb mating this year.

In our Merino flock we use a targeted breeding program using genetic evaluation so we can achieve high growth rates plus combining good skin with fewer wrinkles using ASBV's. Leahcim has consistently used the best technologies available and one of the benefits is that we have removed the need for mulesing and jetting since 2004. The flock has changed to a meatier carcase, plainer-body type without wrinkle, plus we understand the benefit of good skin structure so we have been able to produce excellent wool quality with well aligned fibres requiring no chemical use for fly protection.

We were making no gains thirty years ago - without systematic genetic evaluation we were making little genetic gain. Now with full pedigree data performance recording, and use of ASBVs, we are making significant progress in our flocks. Genomics will give us the next chapter in our breeding direction with higher accuracies on data plus more information about some very hard to measure traits which will be of great benefit to processors and end users of all sheep products.



In our Poll Merino flock over the last fifteen years we have achieved a 30% increase in lambing percentage, a decrease in fleece micron of 5 micron, and our carcase growth, muscle and fat traits have improved. Shearing is now conducted every six months and we are producing high value fleeces while achieving 70mm of staple length plus a greater staple strength on a higher valued skin.

If you do not use genetic measurements then you don't know enough about your animals and you just don't make good progress.

With Genomics there is so much potential for every flock to meet its target for breeding the most productive and profitable sheep in the shortest time possible. If more studs used these measurements and tools they would be amazed at what they would find out about their sheep.

When we started using genetic selection over 25 years ago, I didn't believe it would be possible to breed the type of animals we are breeding now.

Our White Suffolk today is light years better than what we had previously. It used to be the case that producing a 70kg animal at 12 months was the benchmark; now we would expect those weights at 8 months. With genomics data in the future it will allow us a wider information base in which to make informed breeding decisions to maximise our gains within our sheep flock.

Leahcim submitted 20 Poll Merino lamb rams and 10 White Suffolk lamb rams under the subsidised testing on offer as part of the Sheep CRC's Genomics Pilot Project II, but such is the value we place on the results that we paid full cost for a further 20 rams to be DNA tested as part of the program.

The testing of our animals as part of the Genomics Pilot Programs and the Information Nucleus Flock confirmed what we already knew about our flock, but also identified some new information. There is a need for us to increase our fat levels and maintain our fleece weights while keeping an eye on the new emerging traits.

When you add genomic breeding values for hard to measure traits like intramuscular fat, tenderness and lean meat yield etc to our Australian sheep flock and then to our consumer's products, the future for progressive sheep breeders will be very rewarding.