

## **Abstract by Richard Spelman - Application of Genomic Selection in the New Zealand dairy cattle industry**

Application of genomic information has occurred in the New Zealand dairy industry over the last 13 years. The first 10 years has seen limited genetic and economic benefit accrue to farmers and breeding companies. Sequencing of the bovine genome in 2006 generated a pool of SNPs that have been commercialised for the bovine research community. Genotyping thousands of animals over the Illumina 50K panel has resulted in genomic predictions of genetic merit of sufficient accuracy to revolutionise the NZ dairy breeding system. Bulls are used commercially as 1 year-old bulls based on their genomic proof rather than as 5 year-olds based on their daughters performance. Utilising the sires earlier dramatically reduces the generation interval and thus increases the rate of genetic gain by 40-50%. Genomic Selection has been undertaken for four years and initial results have shown that the genomic estimates have been over-estimated. Genomic adjustments have been introduced into the national evaluation to reduce the bias. Statistical tool development, genotype exchanges and genotyping of cows have been undertaken to increase the accuracy of the prediction and the reduced the bias of the evaluation. In addition, sequencing of the dairy cattle population has just commenced in an effort to further improve the genomic predictions and also to detect causative mutations that underlie traits of economic performance.