

ABSTRACTS
*** Author Presenting Paper**

79 Sheep genomics: searching for genes involved in mammalian reproduction. S. M. Galloway^{*1}, K. P. McNatty², and G. H. Davis³, ¹*AgResearch Molecular Biology Unit, Dunedin, New Zealand*, ²*AgResearch, Wallaceville Animal Research Centre, Upper Hutt, New Zealand*, ³*AgResearch, Invermay Agricultural Centre, Mosgiel, New Zealand*.

progress in the identification and characterisation of candidate genes for Inverdale.

Key Words: X-chromosome, sheep, ovulation

DNA technologies are being used in association with extreme genotype selection for production traits in domestic sheep populations in N.Z. The DNA technologies have been applied to lines of animals selected for specific phenotypes to locate the chromosomal regions containing the genes involved, and to isolate the genes themselves. The key requirements are clear phenotypic measurements of the gene effect, family pedigrees in which the gene is segregating, DNA markers and a genetic map, and an understanding of the physiology underlying the phenotype. In order to carry out this work the AgResearch Molecular Biology Unit has led the development of the genetic linkage map of the sheep (<http://www.ri.bbsrc.ac.uk>) with international collaborators. The current map contains over 1000 polymorphic genetic markers. The map provides the ability to follow segregation of DNA markers within pedigrees and to identify chromosome regions that are consistently associated with particular phenotypes. We have focused particular attention to the Inverdale prolificacy gene (Fec XI). Inverdale is a major gene located on the sheep X-chromosome that affects follicular growth very early in development. The effect of the gene in heterozygous female sheep is an increase in ovulation rate by about one extra egg per ovulation and a consequent increase in litter size by an average of 0.6 lambs per ewe lambing. In contrast females homozygous for the gene have non-functional streak ovaries and are infertile. We have constructed a genetic linkage map of the sheep X-chromosome which spans 160 centi-Morgans (cM) and mapped the gene to an 8 cM region near the centre of the chromosome. A diagnostic test using informative flanking markers is now being used to identify carrier sheep in research and commercial flocks. We aim to localise the Inverdale gene to a syntenic group conserved between species to identify potential candidate genes from the human and mouse X-chromosome mapping and sequence information. This paper provides an overview of the processes involved in identification of genes for productive traits in livestock and discusses current