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## **Genomic technologies to create new opportunities for wool growers**

### **Introductory remarks**

A.J. PEARSON

AgResearch, Ruakura Research Centre, Private Bag 3123, Hamilton, New Zealand

The New Zealand wool grower has faced major challenges since the middle of the 20th century, driven largely through competition from synthetic fibres. For some farmers, the long-term downward trend in wool values has resulted in a wool cheque that now barely covers costs of production. Nevertheless, the many positive attributes of wool compared to synthetic alternatives have sustained an industry with a turnover still in excess of \$1 billion per annum.

The challenge to science is to assist in the re-vitalisation of the industry into a long term future. One avenue for industry transformation is through the application of genomics - our understanding of the DNA sequences that specify living organisms. Functional genomics is the study of genes and expressed proteins focused on the identification of specific biochemical roles in tissue and organ function. Over the last decade there has been an explosion in knowledge of mammalian genetic sequences, their inheritance, regulation and function that direct the growth, development and behaviour of all mammalian organs including hair follicles. Hence the leveraging of progress in human and agricultural genomics for applications that benefit the wool industry represents a major opportunity.

For example, the wool industry would be boosted by the development of new sheep

genotypes with increased wool growth productivity while also producing wool types with increased value suited to new markets. Production costs, especially wool harvesting, need to be significantly reduced. Animal health and welfare issues relevant to the New Zealand sheep farmer must also be addressed. The application of genomic technologies could contribute to achieving industry goals in all these areas. Examples of such technologies are described in the following contract session, including opportunities arising from the development of novel biomaterials derived from wool.

While innovations arising from research and development are essential to improving the fortunes of the wool industry, research uptake can be limited by existing processing and marketing channels. In several papers, current value chains in the wool industry are described and the requirement for new mechanisms that better link niche wool markets with producers are identified.

An important objective of the papers in this session is to encourage dialogue between scientists, farmers, processors and marketers on the key issues facing the sector. From these discussions, priority targets and the technical means to achieve them will drive the deployment of the limited R&D resources of industry and government. But, undoubtedly, opportunities are there to be seized.

### **Options for change within the wool supply chain**

A.K. MCDERMOTT; R.M.W. SUMNER AND D.R. SCOBIE

AgResearch, Ruakura Research Centre, Private Bag 3123, Hamilton, New Zealand

#### **ABSTRACT**

Supply chains are the channels along which products flow from producer to processors and manufacturers, distributors and retailers until final consumers purchase them. The businesses along the chain are linked through the transactions between them and the information that they share. Wool is an inherently variable product that cannot be adapted quickly to changes in processor's requirements. As such it is a weak competitor in a section of the global textile marketplace dominated by synthetic textiles derived from petrochemicals. Nevertheless, wool has unique functional advantages over most synthetic fibres. Efficient supply chains are dependent on effective relationships between stakeholders. Reduction of costs incurred along the supply chain requires investment in horizontal and/or vertical relationships to improve information