SESSION ON TRANSGENESIS TECHNOLOGY

PROGRESS IN THE APPLICATION OF GENE TRANSFER TO IMPROVE WOOL QUALITY AND PRODUCTION

INTRODUCTORY REMARKS

GE ROGERS

Department of Animal Science, The University of Adelaide,
Waite Campus, Glen Osmond SA 5064

Transgenesis produced the first successsful transgenic animal when Palmiter et al. (1982) published their paper in Nature announcing the formation of a transgenic mouse expressing growth hormone genes. This dramatic event in reproductive biology signalled the beginning a new era in the manipulation of animal genes for the basic understanding of the molecularn processes of animal development. Research into the application to farm animal production technology followed in 1985 with publications on initial studies of the growth hormone gene introduced into sheep and pigs (Hammer et al 1985; Ward & Nancarrow, 1991).

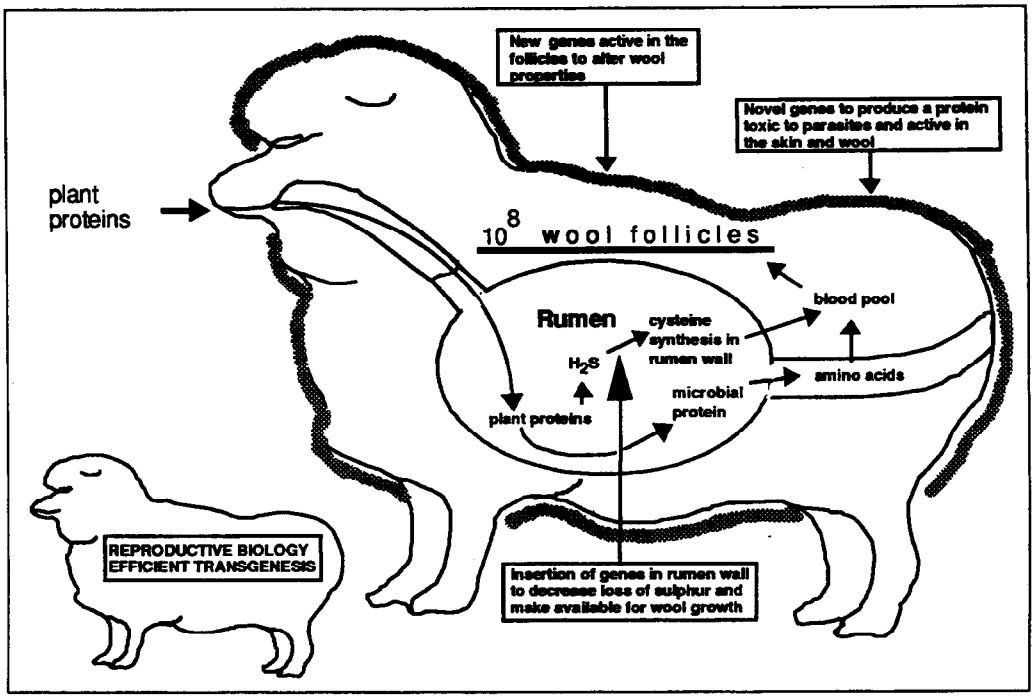

Figure 1. Diagrammatic presentation of sheep transgenesis research programs aimed at the improvement of wool quality and production and discussed in the three papers that follow, including increasing the efficiency of transgenesis.

Transgenic technology applied to livestock has not yet brought about a new animal phenotype that has an introduced character with a marketing advantage but this does not detract from the perceived potential that rests in the technology which is so new, relatively untested and is still being improved. A significant succcess in its application has been to introduce appropriate genes into sheep to produce in their milk, protein products such as antitrypsin and antihaemophilia Factor IX which are used in the treatment of human disease.

This Session presents some ideas and information that are part of current research on sheep that is being carried out by three research groups in NSW and South Australia in a collaborative and complementary fashion under the auspices of the IWS and the CRC for Premium Quality Wool. The discussion begins with the exploration of transgenic gene technology at the University of Adelaide for modifying the properties of the wool fibre to improve its quality and textile performance. Dr. Kevin Ward follows with a description of the research at CSIRO, Division of Animal Production, Prospect on the introduction of novel genes to provide increased nutrition to the follicles for wool growth and to introduce new genes for a phenotype that is resistant to external parasites. Dr. Simon Walker at the Turretfield Research Centre of SARDI, will describe research that is examining the transgenic techniques themselves in order to increase their efficiency and reliability. The objectives of the research to be presented are summarised in Fig 1.

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