

## “CLEAN, GREEN AND ETHICAL” MANAGEMENT: A NEW APPROACH FOR INCREASING REPRODUCTIVE EFFICIENCY IN MERINO SHEEP

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The Australian sheep flock, currently about 107 million, is the smallest it has been for 50 years. There are only about 46 million ewes, most of which are Merinos. The decline in flock size over the past 15 years raises substantial concerns about our capacity to satisfy a growing demand for prime lamb, let alone maintain or increase the productivity of our sheepmeat and wool industries. Clearly, an increase in the rate of reproduction is required. However, in terms of reproductive output, Merino ewes generally perform poorly compared to other genotypes, mostly due to small litter size, high embryo wastage and high lamb mortality.

Our sheep industries are also being challenged by changes in the attitudes of consumers that, in the marketplace, are increasing demand for products that are “clean, green and ethical” (CGE). *Clean* means that there is pressure to consider the effect of our meat and wool on human health, with particular emphasis on the use of hormones, drugs and chemicals for flock management; *green* means that our production systems need to be environmentally sustainable; and *ethical* means that we need to respect animal welfare in our management.

For Merino breeders, this need not be difficult. As we will demonstrate in this series of papers, the Merino is an ideal genotype for CGE production and most aspects of Australia’s extensive production systems are already “clean and green”. All that is required is a re-assessment of the behaviour, physiology and genetics of our Merino sheep so we can better incorporate our natural advantage into modern production systems.

One vision of a “CGE Package” for managing reproduction in Merino sheep is shown in Figure 1. Periods of *focus feeding* are used to improve reproductive outcomes. For precise timing of the periods of feeding, mating must be tightly controlled, or ultrasound must be used to classify the stage and type of pregnancy. Finally, the survival of new-born lambs must be maximised by a combination of good genetics and good management.

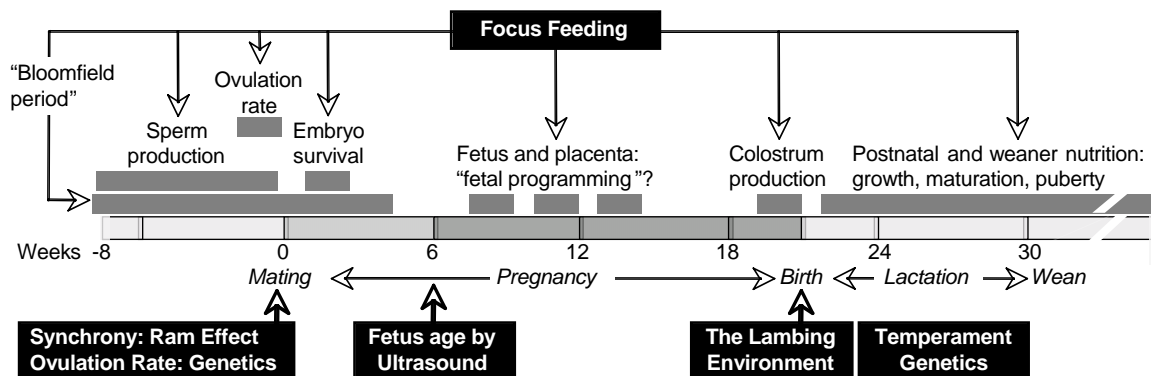


Figure 1. A “Clean-Green-Ethical Management Package” for reproduction in sheep (Martin *et al* 2004)

The first paper in this series is aimed at control of the timing of reproductive events for which we turn to either i) the socio-sexual inputs of *teasing* to induce synchronised ovulation in females that would otherwise be anovulatory, or to ii) ultrasound to determine the number and age of fetuses being carried by the ewes. The second paper deals with one aspect of *focus feeding* and is based on using our knowledge of the responses to nutrition to maximise gamete production and embryo survival. The third paper aims to maximize lamb survival by a combination of management, nutrition and genetic selection for calm temperament in ewes.

None of these approaches involve chemical manipulation of the animals. Importantly, they all have a solid foundation in reproductive biology and, in several cases, they are currently used in commercial practice. However, there is still room for improvement through both basic and applied research – the established CGE tools are not always efficient and, for the tools that are more speculative, we need a better understanding of how they work so we can develop them further. With good science, they can be cost-effective, increase productivity and, at the same time, greatly improve the image of meat and milk industries in society and the marketplace.

MARTIN, G.B., MILTON, J.T.B., DAVIDSON, R.H., BANCHERO HUNZICKER, G.E., LINDSAY, D.R. and BLACHE, D. (2004). *Anim. Reprod. Sci.* **82-83**: 231-46.

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