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Management and selection potential in commercial sheep

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SUMMARY

The advantages of collecting various measurements and using genetic information in commercial sheep flocks have been largely unidentified and underutilised. Traditionally, most genetic progress in commercial flocks has been derived from ram selection (Atkins *et al.* 2006) and few measurements have been made on ewes. The aim of this project is to produce tools to enable practitioners to identify ways in which maximum benefit can be achieved through more effective and efficient use of individual animal information in commercial sheep flocks. The tools will examine the potential use (and re-use) of production information (after hogget selection) for mate allocation, targeted management and culling decisions as well as the economic impact of these combinations. Much work has already been completed through the Cooperative Research Centre for Sheep Industry Innovation with precision sheep management (Atkins *et al.* 2006), which uses individual measurements to predict whole flock outcomes. However, the ability to predict production changes at an individual level has not been possible. This would enable a better understanding of the production and economic consequences of management and selection decisions on segments of the flock and the population as a whole.

Decision support tools have been used to predict the impact of current decisions on potential future decisions and the future production for whole flock changes over time (Kelly *et al.* 2006). They have highlighted the benefits of optimising flock structure to ensure optimal genetic progress as well as identifying selection options to achieve desired breeding objectives (Atkins *et al.* 2006). Ewe selection is often perceived to be of little benefit due to the low genetic gain it achieves. However, current generation gains from selection can be quite large (and profitable), with genetic progress an added advantage. Previous tools capture the overall benefit but cannot separate these into current and future gains.

Separating animals into similar management groups (according to their level of production or risk) can utilise the variation within flocks for both current and future generation gains. The immediate benefit of flock segmentation is easy to value. The difficulty is tracking the changes within these flocks over time. What do the progeny from these different groups look like? Will the progeny be retained in this group? What is the variation within groups? How many groups are required to best fit production constraints and market opportunities? Once the general potential changes and expected variation of flock segmentation is understood, various management and selection strategies within these groups will be investigated.

This will be a useful investigation for the whole industry as many resources are being allocated to developing new genetic, measurement and management technologies, but much less research is devoted to investigating the best ways of applying and combining this new information in the design and implementation of breeding and production programs, and how it might complement the strategies already adopted by industry.

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