

Foreword

Previous studies have shown that ewe nutrition during key periods of development *in utero* and pre-weaning can have permanent impacts on the production potential of the progeny (reviewed by Bell 2006; Greenwood *et al.* 2010). In addition, the impacts of varying nutrition before joining or during pregnancy and lactation on ewe reproduction (Robinson *et al.* 2002), ewe wool production and quality (Masters *et al.* 1993) and lamb birthweights and survival (Knight *et al.* 1988) are well recognised. However, the importance of these effects in the context of developing practical feeding systems for ewes has received little attention and many studies have limited practical value, having considered only extreme nutritional regimes outside the boundaries of commercial reality. Furthermore, few studies have reported the effects of feed on offer and ewe liveweight change during different periods of pregnancy and lactation on the performance of both ewes and their progeny over their lifetime.

In the Mediterranean regions of southern Australia, the liveweight of Merino ewes typically fluctuates throughout pregnancy and lactation. The timing, duration and severity of these changes depend largely on stocking rate, supply of paddock feed and time of lambing. We hypothesised that we could use knowledge of ‘*the annual variation in the liveweight profile*’ of the ewe to reliably predict her performance and the impacts of her nutrition on the lifetime performance of her progeny. We further hypothesised that this knowledge, together with appropriate decision tools, could be used by producers to manage the liveweight profile of ewes to improve whole-farm profitability. To test these hypotheses in the Lifetimewool project, we initially conducted experiments that managed ewes to achieve a wide range of liveweight profiles that allowed us to generate equations that predict the performance of both the ewe and the lifetime performance of her progeny.

The series of papers published in this Special Issue report on the effects of liveweight profiles of ewes on their wool production and reproduction (Ferguson *et al.* 2011, p. 763), the birthweight and survival of their lambs (Oldham *et al.* 2011, p. 776), their growth and survival after weaning (Thompson *et al.* 2011a, p. 784) and production and quality of the progeny’s wool during their lifetime (Thompson *et al.* 2011b, p. 794). These production responses were confirmed at a paddock scale in a range of environments and a range of Merino genotypes across southern Australia (Behrendt *et al.* 2011, p. 805; Hocking Edwards *et al.* 2011, p. 813). In addition, the production responses developed by the Lifetimewool project were used to determine the optimum liveweight profile for ewe flocks in different regions (Young *et al.* 2011, p. 821). Failure to include the effects on progeny reported by Oldham *et al.* (2011) and Thompson *et al.* (2011b) incorrectly identified which liveweight profile is optimum and provided an inaccurate estimate of whole-farm profitability.

In the past, sheep producers have been low adopters of nutritional recommendations for ewes and this has been attributed to the low relative advantage of the innovations,

poor targeting of messages to the audience, a focus on awareness-raising activities rather than adoption activities, poor ‘packaging’ of information and few effective tools to aid decision making. With this in mind, we established a process to support the development and adoption of practical and effective guidelines and quantify their impact on the industry (Dart *et al.* 2011, p. 842; Jones *et al.* 2011, p. 857). This included the conversion of the management guidelines from the liveweight profile of ewes to a condition-score profile to better match producers needs and skills (van Burgel *et al.* 2011, p. 834) as well as the development of new tools (Curnow *et al.* 2011, p. 851) and novel delivery approaches (Trompf *et al.* 2011, p. 866) to support on-farm practice change. The guidelines developed by the Lifetimewool project were extended through a range of approaches that resulted in more than 3000 producers changing practice, which represented 12% of all sheep producers in southern Australia in 2008.

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