'Lifetime Wool' - Effects of Nutrition During Pregnancy and Lactation on Mortality of Progeny to Hogget Shearing

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ABSTRACT

The 'Lifetime Wool' project imposed a range of nutritional treatments on single bearing ewes during pregnancy and lactation that were successful in generating a range of liveweights /condition scores at lambing and during lactation at experimental sites in VIC and WA in 2001 and 2002. The birth weight was not influenced by maternal nutrition to day 90 of pregnancy. Average feed-on-offer (FOO) between day 90 of pregnancy and lambing explained 40% ($P < 0.001$) of the variation in birth weight in both years at the VIC site, and 57% of the variation at the WA site in 2001. However, there were no consistent effects of either condition score at day 90 or FOO during late pregnancy and lactation on the mortality of single lambs to 48 hr after birth, with the exception of the 800 kg DM/ha FOO treatment at the VIC site (31 *v* 14%; $P < 0.002$). High mortality from weaning to hogget shearing was associated with 100 mm of rainfall over 3 days within one month of weaning (WA 2001) and a summer water problem (VIC 2002) but in neither case was it related to the nutritional treatments. At these same sites and years there was a significant effect of the lowest FOO treatment on the mortality between marking and weaning in WA (25% ± 5 v 5% ± 5 for the other treatments; $P < 0.002$) and between 48 hr after birth and marking in VIC (10% ± 3 v 2% ± 3 for the other treatments; $P < 0.001$). The progeny deaths relating to FOO treatment after weaning had a major impact on the profitability of the different ewe feeding strategies.

AIMS

Lamb mortality is largely a function of birth weight and cold stress around the day of birth (Holst *et al.* 1986; Obst and Day 1968). Restricting the level of nutrition to the pregnant ewe can reduce lamb birth weight and increase mortality of newly born lambs depending on the timing and severity of the restriction and subsequent nutrition (Holst *et al.* 1986). However, most of the literature on lamb mortality only follows survival to marking. The full impact of lamb mortality is not realised in whole-farm profit until the progeny are either sold or shorn for the first time (Young *et al.* 2004). The 'Lifetime Wool' project (Thompson and Oldham 2004) imposed a range of nutritional treatments on ewes during pregnancy and lactation. These treatments were successful in generating a large range of liveweight (LW)/condition score (CS; Russel *et al.* 1969) profiles at experimental sites at Coleraine in Victoria (VIC) and Kendenup in Western Australia (WA) (Ferguson *et al*. 2004). This paper reports on the influence of the nutrition treatments on winter/spring lambing ewes on the mortality of single born progeny from birth to their first adult shearing at around 18 months of age.

METHOD

At two sites (VIC and WA) ewes with a mean LW of 46 kg and mean CS of 2.5 at artificial insemination in February/March of 2001 and 2002 were differentially fed to achieve a CS of either 2.0 or 3.0 by Day 90 of pregnancy. At Day 90, sheep within each CS flock were allocated to plots maintained at five different levels of feed-on-offer (FOO; Hyder *et al*. 2004) until lambs were weaned in November each year (design = 2 CS x 5 FOO levels = 10 plots). There were 2 or 3 replicates of 20 or 30 pregnant ewes in WA and VIC respectively. Lambs were born in late July (WA) and late August (VIC) and were weighed and tagged at birth. After weaning at both sites, all progeny were grazed together.

RESULTS

The average birth weight of single born lambs at both sites and both years were between 4.5 and 5.5 kg, and mortality in the first 48 hr varied from < 5 to 30%. The birth weight was not influenced by maternal nutrition to day 90 of pregnancy in VIC in either year and in WA in 2002. FOO between day 90 of pregnancy and lambing explained 40% ($P < 0.001$) of the variation in birth weight in both years at the VIC site, and 57% of the variation at the WA site in 2001. However, There were no consistent effects of either CS at day 90 or FOO on the mortality of single lambs to 48 hr, with the exception of the 800 FOO

treatment at the VIC site (31 *v* 14%; P < 0.002). High mortality from weaning to hogget shearing was associated with 100 mm of rainfall over 3 days within one month of weaning (WA 2001) and a summer water problem (VIC 2002) but in neither case was it related to the nutritional treatments (figure 1). In these same sites and years there was a significant effect of the lowest FOO treatment on the mortality between marking and weaning in WA in 2001 (25% ± 5 v 5% ± 5 for the other treatments; P < 0.002) and between 48 hr and marking in VIC in 2002 (10% ± 3 v 2% ± 3 for the other treatments; P < 0.001).

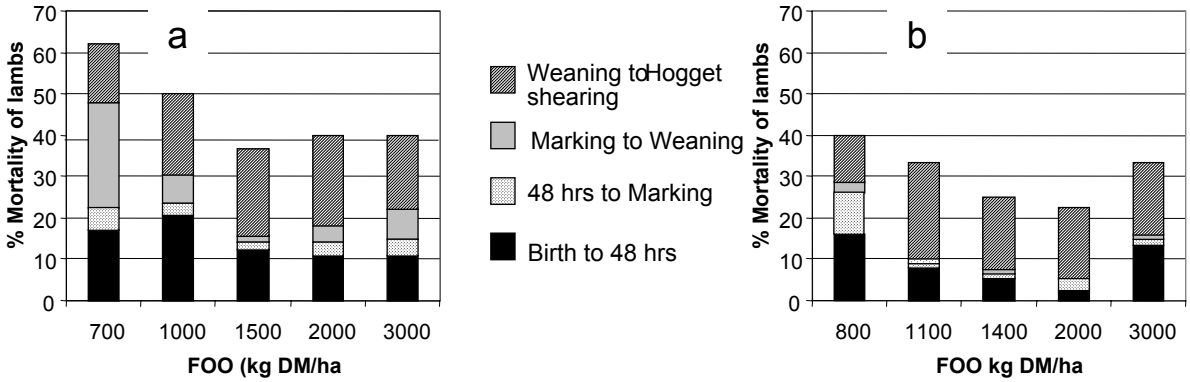

Figure 1. The percentage mortality to hogget shearing of the progeny in WA (2001, a) and VIC (2002, b) from 5 feed-on-offer (FOO) treatments during late pregnancy and lactation.

CONCLUSION

It is clear that with a winter/spring lambing when ewes had > 800 kg DM/ha of FOO in front of them from day 90 of pregnancy that birth weight and survival of single born lambs was remarkably resilient. However, changes in other important progeny traits such as wool production and quality (Paganoni et al. These proceedings) may be induced at levels of maternal nutrition that do not necessarily influence birth weight and survival. The progeny deaths relating to FOO after weaning had a major impact on the profitability of the different ewe feeding strategies reported by Young *et al.* (2004).

KEY WORDS

Lifetime Wool, Ewe nutrition, birth weight and lamb mortality.

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