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Effect of high and low pasture allowance during pregnancy on ewe lamb pregnancy performance

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Introduction It is established that breeding ewe lambs (8-9 months of age, hogget) can negatively affect their 18-month liveweight and breeding performance (Kenyon *et al.* 2007). Therefore the aim of any ewe lamb breeding regimen should be to ensure they gain liveweight during their first pregnancy. However, under housed, concentrate feeding conditions high total liveweight gains in pregnancy have been associated with increased fetal loss, light lamb birthweight and lower lamb survival rates to weaning (Wallace *et al.* 2000). The effects of ewe lamb liveweight gains during pregnancy under pastoral grazing systems has not been thoroughly examined in New Zealand.

Materials and methods In study one, ewe lambs were randomly allocated to one of three total liveweight gain regimens beginning 5 days after breeding. These included Low (n=80), Medium (n=80) and High (n=80) total liveweight gains in pregnancy. Average daily gains were 60, 130 and 230 g/d respectively in pregnancy. In study two, two total liveweight gain regimens began four days prior to breeding and these included Medium (n=165) and High (n=165), which achieved average gains of 130 and 200 g/d respectively in pregnancy. In both studies ewe lambs were offered perennial ryegrass (*Lolium perenne*) and white clover (*Trifolium repens*) mixed swards. The liveweight changes in the pregnancy period were achieved by regular weighing and adjustment being made to the grazing area offered. The ewe lambs were scanned for pregnancy status in mid-to late-pregnancy to determine pregnancy loss. Liveweights of lambs born were measured at birth and weaning and the young dams were also re-weighed at the weaning of their lambs. In both studies ewe lamb treatments were merged and managed as one in lactation. Liveweight measures of the lambs and young dam were analysed using the Generalised Linear Model procedure in SAS (SAS 2005). Pregnancy loss and lamb survival were analysed using the GENMOD procedure for categorical data in SAS.

Results In study 1, a greater ($P < 0.05$) percentage of Low (32%) and High (28%) ewe lambs lost pregnancies compared to their Medium counterparts (3%). Lambs born to Low ewe lambs were lighter ($P < 0.05$) at birth and weaning (3.5 ± 0.16 and 18.1 ± 1.01 kg respectively) than those born to Medium and High ewe lambs (4.0 ± 0.19 , 20.6 ± 0.76 and 4.0 ± 0.19 and 21.8 ± 0.98 kg respectively). They also displayed lower ($P < 0.05$) survival rates to weaning. Lamb born to Medium and High treatment groups did not differ in birthweight, weaning weight or survival to weaning. At the weaning of their lambs, High treatment ewe lambs were heavier (55.8 ± 1.07 kg, $P < 0.05$) than both Medium (47.9 ± 0.90 kg) and Low (45.2 ± 1.07 kg) ewe lambs, which did not differ. In study 2, ewe lamb treatment had no effect on pregnancy loss, lamb weight at birth or weaning or lamb survival. At the weaning of their lambs, medium liveweight gain ewes were lighter ($P < 0.05$) than High ewes (48.9 ± 0.9 vs 57.9 ± 0.8 kg respectively).

Conclusions The results of study one suggests that pregnant ewe lambs should be managed to avoid relatively low liveweight gains in pregnancy. Failure to do so will have adverse consequences for both the young dam and her offspring. In both study one and two, newborn lamb performance to weaning did not differ between those born to ewe lambs on either of the Medium or High liveweight gain regimens suggesting no advantage of a relatively high liveweight gain. However, from the perspective of the young dam, the higher liveweight gains in pregnancy resulted in heavier weights at weaning. A heavier young dam at the weaning of her lambs is more likely to achieve a suitable 18-month breeding weight. Interestingly in study one, high liveweight gains were associated with increased pregnancy loss which agrees with the findings of Wallace *et al.* (2000) under house concentrate feeding conditions. This relationship was not observed in study two and warrants further examination to determine if there is an absolute minimum liveweight gain required to observe increased fetal loss.

References

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