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The effect of nutrition during pregnancy on hogget reproduction

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Abstract

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The reproduction rate of hoggets in New Zealand is much lower than that observed in adult ewes. New Zealand farmers have indicated this is a major limitation to the uptake of hogget breeding and lambing. A series of studies conducted during pregnancy in the U.K. under housed conditions, utilising a concentrate diet, reported rapidly grown hoggets had reduced placental and fetal development and lamb birth weight. It is, therefore, possible nutrition during pregnancy plays a role in the poor reproductive performance seen in New Zealand hoggets. This thesis investigates the impact of 'low', 'medium' and 'high' levels of feeding on pasture during pregnancy on hogget pregnancy rate, fetal loss, lamb birth weight and growth rate of resulting lambs.

Two-hundred-and-forty hoggets that were mated (identified by crayon tupp mark) during a five day breeding period were randomly allocated one of three (n=80) nutritional regimes ('low', 'medium' and 'high'). The 'low' treatment group during the first 100 days of pregnancy were fed to maintain live weight. From day 100 until term, these hoggets were offered herbage to ensure a daily live weight change of 100 g/day. The 'medium' treated group were fed to ensure live weight change was 100 g/day throughout the entire pregnancy period, while the 'high' treated group were offered *ad libitum*, with the aim of achieving 200 g/day throughout the entire pregnancy period.

The target live weight changes were achieved in the 'low', 'medium' and the 'high' hogget feeding treatment groups. Pregnancy rates at day 50 of pregnancy were significantly ($P<0.05$) higher in the 'medium' (66%) than the 'high' (46%) treated hoggets. At P87, pregnancy rate was significantly higher in the 'low' and the 'medium' treated hoggets than the 'high' treated hoggets with pregnancy rates of 58, 66 and 33%, respectively. This led to a significantly ($P<0.05$) reduced proportion of

the hoggets lambing in 'low' and 'high' feeding treatment hoggets when compared to the 'medium' hogget feeding treatment. Lamb birth weight was reduced in lambs born to the 'low' (3.5 ± 0.16 kg) treatment hoggets when compared to the 'medium' (4.0 ± 0.19 kg) and the 'high' (4.0 ± 0.19 kg) hogget treatment groups. A 'high' level of nutrition during pregnancy did not result in reduced lamb birth weight compared to the 'medium' level of nutrition. At L87, lambs born to 'low' (18.1 ± 1.01 kg) treated hoggets were significantly ($P < 0.05$) lighter than lambs born to 'medium' (20.6 ± 0.76 kg) and 'high' (21.8 ± 0.98 kg) treated hoggets. The numbers of lambs reared at L87 was 15, 27 and 17 for 'low', 'medium' and 'high' treated hoggets, respectively.

In conclusion, feeding hoggets at a 'low' and 'high' level of nutrition led to a substantially reduced number of lambs produced. In addition, lambs born to the 'low' fed hoggets were much lighter than lambs born to 'high' fed hoggets at L87. Therefore, this study indicates that farmers wishing to maximise reproductive performance of hoggets should feed hoggets to ensure live weight gain during pregnancy is above 60 g/day but below 200 g/day.

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