

THE EFFECT OF SHORT-TERM NUTRITION DURING MID PREGNANCY ON PLACENTAL AND FOETAL GROWTH IN TRIPLET-BEARING BOOROOOLA X SOUTH AUSTRALIAN MERINO EWES

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Reproductive *potential* of the Australian Merino can be improved substantially by utilization of the Booroola high fecundity F gene. However, gains in nett reproductive performance are limited by *poor* lamb survival. A positive relationship between lamb survival and birthweight is well documented. Since birthweight and placental weight are highly correlated (Mellor 1983), factors affecting placental growth may ultimately influence lamb survival. We examined the effect of short-term nutrition during mid pregnancy on placental and foetal growth.

The oestrous cycles of multiparous 5.5 yr-old Booroola x South Australian Merino ewes, heterozygous for the F gene, were synchronized using intravaginal progestagen peasaries (Repromap, Upjohn Pty Ltd). The ewes were inseminated directly into the uterus with fresh semen 51 h following pessary removal and PMSG injection (400 iu; Pregnecol, Heriot Ag. Vet. Pty Ltd). Thirty one triplet-bearing ewes were allocated to three groups and fed from day 75 to 102 of gestation: 1) at maintenance; 500 g of an oat/pea mixture (80:20 w/w), 2) unrestricted; the foregoing ration and 3) unrestricted; lupins. Ewes were slaughtered on day 103 and the uterus and its contents were weighed (Table 1).

Table 1 Uterine, placental and foetal measurements on day 103 of gestation in triplet-bearing Booroola x S.A. Merino ewes

Group	Gravid uterus (kg)	Uterus (g)	Placenta (g)	Foetus (g)
Maintenance (oats:peas) (n = 11)	5.88 (0.28)a	539 (41)a	1086 (73)a	926 (23)a
Unrestricted (oats:peas) (n = 10)	6.41 (0.32)a	542 (47)a	1059 (85)a	978 (25)ab
Unrestricted (lupins) (n = 10)	6.45 (0.30)a	578 (45)a	1121 (80)a	1029 (26)b

Least-squares means (s.e.) within columns having a common letter do not differ significantly ($P > 0.05$).

Foetal growth was significantly improved by short-term ad libitum feeding of lupins ($P < 0.05$). Differences between treatment groups for placental and uterine weights were not significant. A placental *response* to improved nutrition may have been negated by a) a maternal ability to supply endogenous nutrients for maximum placental growth or b) a placental inability to increase in size through either cell hyperplasia or hypertrophy. Alternatively, selection of a larger sample size may be necessary to detect a placental response.

We conclude that short-term nutrition during mid pregnancy improves foetal but not placental growth in triplet-bearing Booroola x South Australian Merino ewes.

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