Border Leicester x Merino Dams Lose Fewer Lambs to Starvation than Merino Dams

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The procedure of autopsy, outlined by Holst (2004), identifies 10 causes of death in neonatal lambs. Post mortem evidence shows that common causes include dystocia (20%), birth injury (47%), starvation (21%) with the remaining 12% due to other factors including exposure, predation and premature birth (Holst *et al.* 2002). Lamb survival can also be influenced by variation between dams (Lee *et al.* 2009) and breeds (Holst *et al.* 2002), and this paper discusses breed differences in neonatal lamb mortality due to changes in the proportion of lambs whose death was attributed to starvation.

Artificial insemination of 668, 5 and 6 y.o. Merino and Border Leicester Merino dams, occurred in 2003 and 2004. Representing Poll Dorset, Merino and Border Leicester, 32 sires were selected for muscling; growth; and muscling and growth (Hopkins *et al.* 2007a, b). In 2003, Border Leicester x Merino (BLM) dams were used but not in 2004. Around 1800 lambs were born, 223 to BLM dams. In total, 397 lambs of both dam breeds subsequently died and were autopsied. The binary responses for starvation (Yes or No) were analysed using logistic regression in ASReml (Gilmour *et al.* 2006). Fixed effects included year, sex, sire breed, dam breed, litter size and birth weight. Random terms included dam, sire group and an interaction between dam and year. Non significant terms were dropped from the model. Lambs from unknown dams were not included in the analysis.

Preliminary analysis of all lambs born revealed a significant difference between breeds ($P < 0.001$), where lambs from BLM dams had lower mortality. Of all dead lambs, 26% died due to starvation, with the proportions significantly different according to dam breed ($P = 0.01$) and litter size ($P = 0.03$). Table 1 shows that very few lambs from BLM dams died from starvation.

Table 1. Number of dead lambs, litter size and breed. Number of starved lambs in parentheses

Dam breed	Singleton	Twin	Triplet	Quadruplet+	Total
Merino	18 (4)	143 (34)	126 (47)	26 (5)	313 (90)
BLM	1 (0)	6 (0)	21 (2)	10 (0)	38 (2)
Total	19 (4)	149 (34)	147 (49)	36 (5)	351 (92)

+ a single quintuplet bearing dam is included with the quadruplet bearing dams

As with Holst *et al.* (2002), the preliminary analysis found 3% fewer lambs died when born to BLM dams. The availability of autopsy data has provided an opportunity to examine reasons for the breed difference, which is partly due to starvation. It is important to note that the cause of death in neonatal lambs can change within a lambing period; between seasons and across years. Where our data report a significant breed difference within a category of death, this difference can not be extrapolated for all seasons and all years. Nevertheless, these results demonstrate that autopsy data can help explain where differences between breeds occur. The data also show that death due to starvation tends to increase with increasing litter size. This suggests that starvation as the cause of death becomes more important as fertility increases among Merino dams.

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