# Observations of Merino ewe parturition behaviour and lamb survival

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Dystocia, and the subsequent effects of difficult lambing, are a primary cause of peri-natal ewe and lamb mortality, and costs the Australian sheep industry close to $500 million in prevention and lost production (MLA 2015). While incidences of dystocia may be considered low worldwide (< 5%) (Ismail, 2017), the occurrence of assisted intervention during lambing can be as high as 66% (Holst *et al*., 2002; Dwyer and Bünger, 2012), representing a major economic and animal welfare concern associated with ewe and lamb mortality (Sharma *et al*., 2014). Therefore, we determined and described the level of dystocia present within an intensively managed flock of 136 mature, multiparous singleton and multiple-bearing Merino ewes as part of a large-scale MLA funded lamb survival project conducted over multiple seasons (autumn versus spring) during 2018 and 2019. From day 130 of gestation, ewes were housed individually in indoor pens for lambing and were under 24-hour infrared video surveillance. The beginning of labour/parturition was recorded when ewes displayed repeated pawing, restlessness, contractions, or an externalised water sack was observed. Parturition length (PL: mins), parturition difficulty (PD: 1 – 3) (Dwyer, 2003), meconium score (1: normal (no staining), 2: light, 3: moderate, and 4: severe1 – 4), gestation length (GL) and lamb survival to 7d post-partum were recorded for 276 lambs. PL was $Log_{10}$ transformed to attain normal distribution. Statistical analysis was performed using IBM SPSS version 26. A Pearson's correlation was used to determine the relationship between each of the variables, and an ANOVA was conducted to determine seasonal, ewe age and litter size differences. There was a significant interaction (P = 0.001) between PL and lamb survival to 7d (alive: 40.9 ± 5.4 mins vs dead: 63.8 ± 12.7 mins. Figure 1), and a significant interaction (P = 0.001) between PD and survival to 7d, with 19% lamb mortality associated with a PD score of 1 compared to 48% lamb mortality associated with a PD score of 3. Further, there was a weak correlation between PL and PD (R = 0.27; P = 0.002. Figure 2), as well as PD and lamb meconium score (R = 0.18; P = 0.004). Multiple-bearing ewes had higher PD compared to singleton, and younger ewes had more difficulty compared to older ewes (7yo:1.0 versus 3yo: 1.6; P = 0.001). There was a seasonal difference in GL (autumn: 150.63 ± 0.4 days versus spring:148.7 ± 0.3 days; P = 0.002); however, the shorter GL in spring did not affect lamb survival.

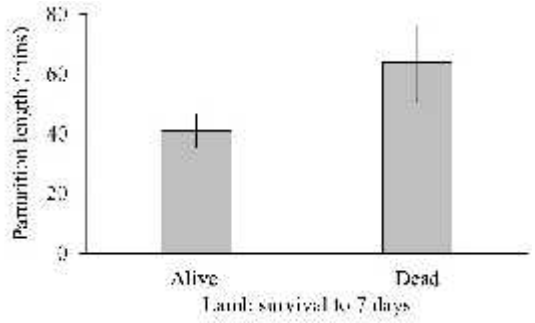


**Figure 1: The relationship between partition length (mins) and lamb survival to 7 days**

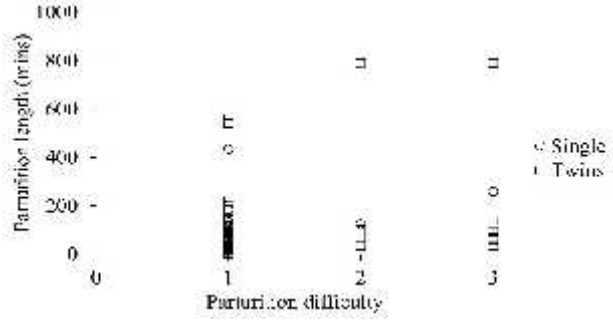


**Figure 2. The effect of litter size on parturition length and parturition difficulty**

As 48% lamb mortality to 7d could be associated with increased partition difficulty, these findings suggest that scanning for litter size, especially in younger ewes, would be beneficial to producers and enable them to anticipate and manage lambing based on age of dam and during different seasons.

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