

Interactions between neonatal lamb vigour and faecal soiling at weaning in three breeds of sheep

S M Matheson, C M Dwyer, L Bünger, J G M Houdijk

SAC, Edinburgh, United Kingdom

Email: stephanie.matheson@sac.ac.uk

Introduction Faecal soiling, i.e. the accumulation of faeces in the wool of the breech area (tail, perineum and anus), is a factor predisposing sheep to cutaneous myiasis (flystrike). Soiled wool clusters together into ‘dags’ which is associated with longer wool fleeces and has contamination implications for meat processing and the wool industry. However, the basis of faecal soiling is not clearly understood and may include infectious agents, genetic and environmental factors. Thus breed and early nutritional environment, and the lamb’s response to this, may affect faecal soiling. For example, ewe nutrition, and larger litter size, has an effect on foetal growth and subsequent lamb vigour after birth, as well as on the level of parasitism. The aim of this study was to investigate whether breed, litter size and poor vigour at birth result in higher levels of faecal soiling at weaning.

Materials and methods Data from lambs from 284 ewes: 32 Scottish Blackface (BF), 29 Suffolk (S) and 203 Texel (T), born in the 2008 breeding season, were collected from birth to weaning. Ewes were group-housed on straw-bedded large pens prior to lambing, and were fed a concentrate diet and *ad libitum* hay to satisfy nutrient requirements. All ewes were allowed to give birth unaided, as far as possible, according to a standard lambing protocol. Ewes gave birth to 382 lambs (BF 43, S 49, T 291). All births were recorded live by observers and lamb sex, litter size, amount of birth assistance, vigour score (at 5 minutes of age), sucking assistance and birth weight were recorded for each lamb. Ewes and lambs remained indoors for the first 3 days after birth and then were moved outdoors until weaning (approximately 16 weeks of age). At weaning lambs were weighed and dag scored, using a pictorial scoring system (ranging from 0–4). Neonatal scores (birth assistance, lamb vigour, sucking assistance) were analysed using Kruskal-Wallis non-parametric one-way-ANOVAs while birth weight was analysed using a one-way-ANOVA (Genstat 11). Dag scores and weaning weights were ranked and then analysed via Restricted Maximum Likelihood (REML) in Genstat, fitting lamb vigour (and dag score for weaning weight,) as a covariate and breed, sex and litter size as fixed effects; ewe identity was fitted as a random effect.

Results There were significant effects of lamb vigour score (Wald=61.48, d.f.=1, $P<0.001$), breed (Wald=94.14, d.f.=2, $P<0.001$) and litter size (Wald=11.80, d.f.=3, $P=0.01$) on dag rank (figure 1A) but there was no effect of lamb sex (Wald=2.63, d.f.=1, $P=0.105$). There was an interaction of breed*litter size (Wald=9.06, d.f.=3, $P=0.03$) but no interaction of lamb vigour*breed (Wald=3.66, d.f.=2, $P=0.162$). For weaning weight, lower vigour lambs were lighter than higher vigour lambs (figure 1B; Wald=6.90, d.f.=4, $P=0.009$); dag score, with dirtier scoring lambs being lighter than cleaner lambs (Wald=7.93, d.f.=4, $P=0.005$); breed, with T being heavier than S or BF (Wald=15.52, d.f.=2, $P<0.001$); litter size, with singles being heavier than multiples (Wald=39.34, d.f.=4, $P<0.001$); and sex, with males being heavier than females (Wald=6.96, d.f.=1, $P=0.008$). There was also an interaction of dag score*sex*litter size (Wald=5.96, d.f.=2, $P=0.051$).

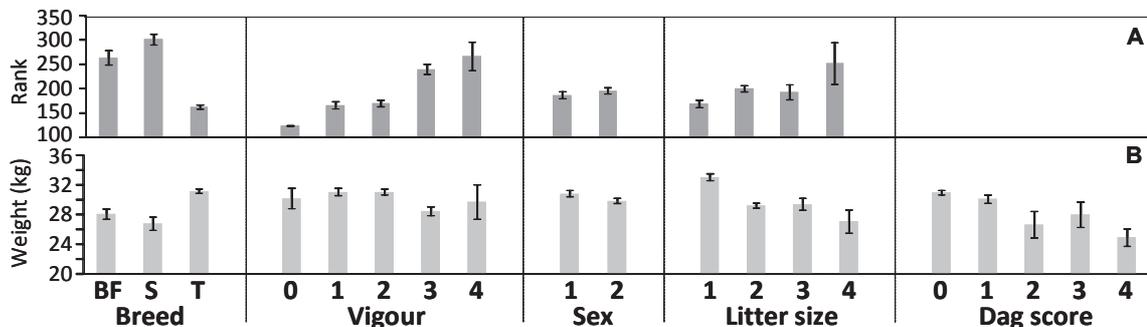


Figure 1 (A) Effects of breed, lamb vigour, lamb sex and litter size on dag rank at weaning. (B) Effects of breed, lamb vigour, lamb sex, litter size and dag score on weaning weight. Values are mean±SEM.

Conclusions Factors affecting neonatal lamb vigour appear to have continuing effects throughout later life as suggested by the relationship between lamb vigour and dag score, and dag score and weaning weight. The positive relationships found between vigour and dag scores may arise because high vigour lambs are quicker to stand and suck, resulting in greater intake of colostrum and better immunity in later life. As dag score may be associated with gastro-intestinal parasitism, the high vigour lambs may be better able to deal with worm infection in later life. Additionally, higher vigour lambs, by sucking quickly, may also be better bonded to their dams resulting in increased opportunities to learn to avoid faecal-contaminated pasture, and thus may have a reduced risk for ingesting worm larvae. Studies suggest that dag score is correlated with the level of parasite exposure and may explain the negative correlation between dag score and weaning weight, as parasite exposure and weight gain are negatively correlated.

Acknowledgements This work was supported by the Scottish Government (RERAD). SMM is supported by a BBSRC CASE studentship in association with the Suffolk Sheep Society. Farm and technical staff at SAC sheep unit Woodhouselee Farm assisted in collecting data.