The role of ewe and lamb behaviour in lamb survival

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Behaviour and survival

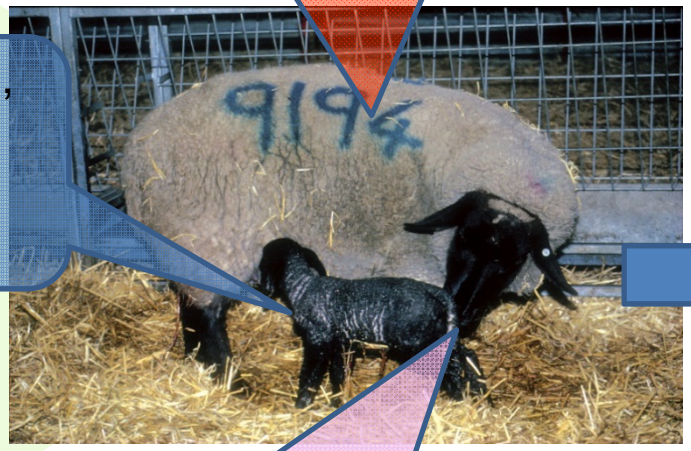
- For most mammals maternal care is essential for survival
  - Nutrition
  - Protection
  - Thermoregulation
  - Comfort
  - Opportunities for social learning

- Precocial lamb also has some responsibility for it's own survival *(Dwyer & Lawrence, 1999)*
  - Finding the udder
  - Sucking

Bonding behaviour at birth

Licking, low-pitched bleats, udder acceptance; absence of aggression; olfactory memory: 'selectivity'

Activity, udder seeking, sucking, thermoregulation, following



Mutual recognition (all sensory modalities); spatial proximity; sucking interactions; distress at separation;
Maternal vigilance

Improved lamb survival

Maternal behaviour and survival

- Ewes with low maternal behaviour score have higher lamb mortality *(O'Connor et al., 1985; Lambe et al., 2001)*
- Some evidence for differences in maternal behaviour and temperament influencing lamb survival *(Murphy et al., 1998; Bickell et al., 2010; Plush et al., 2011)*
- Several studies have shown breed differences in maternal behaviour and lamb survival *(reviewed by Dwyer & Lawrence, 2005)*
- Ewe maternal behaviour did not affect lamb behaviour and time to stand/suck with embryo transfer *(Dwyer & Lawrence, 1999)*

Lamb behaviour and survival

- Higher mortality in lambs that were slow to stand and suck *(Dwyer et al., 2003; Madani et al., 2013)*
- Sucking assistance predicts lamb future survival *(Dwyer & Nath, in prep)*
- Lambs of ‘high-loss’ sires were quicker to stand, reach the udder and suck than from ‘no loss’ sires *(Hergenhan et al., 2014)*
- Lambs from lines selected for higher survival were quicker to suck than low line lambs *(Cloete & Scholtz, 1998)*
- Better survival in lambs that could distinguish their mother from other ewes at 12h old *(Nowak et al., 1992)*

What affects expression of lamb behaviour?

- Litter size – triplets slower than singles or twins
- Male lambs vs female lambs
- Difficult delivery
- Weather at lambing
- Birth weight *(Dwyer, 2003)*
- Prenatal nutrition (fatty acids, vitamin E)
- Mid pregnancy shearing (*Banchero et al., 2010*)
- Lamb maturity and physiology *(Dwyer & Morgan, 2006; Miller et al., 2010)*
- Breed and sire within breed: genetics

Genetics of lamb behaviour

- Breed, line within breed and sire effects on lamb behaviour
- Developed scoring system for birth assistance, lamb vigour at 5 minutes old and sucking assistance
- Each 5 point scale from 0(best) - 4(worst)
- Validated against behaviour observation *(Matheson et al., 2011)*
- Recorded on farm over 4 years: records on 11,092 lambs on 188 pedigree flocks

Genetic Parameters

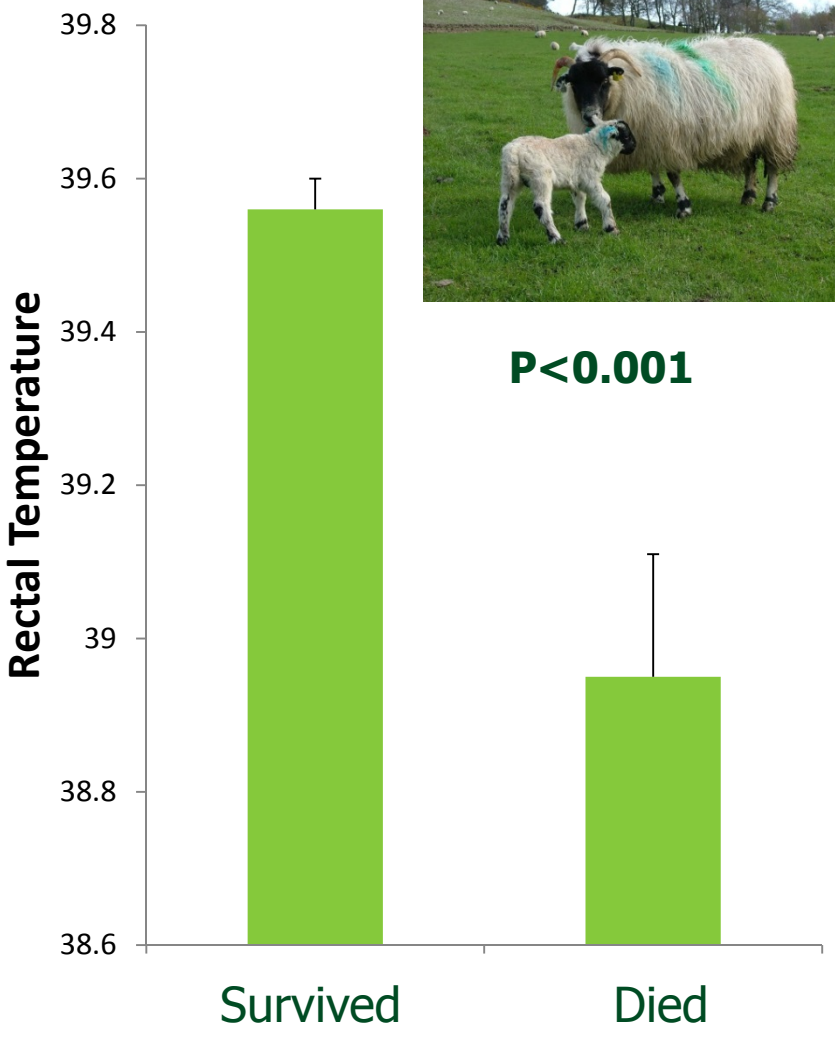
	Birth Assistance	Vigour	Sucking Assistance
Birth Assistance	**0.26 ± 0.033**	0.38 ± 0.011	0.29 ± 0.011
Vigour	0.68 ± 0.059	**0.39 ± 0.037**	0.60 ± 0.008
Sucking Assistance	0.54 ± 0.074	0.80 ± 0.038	**0.31 ± 0.034**

Moderately heritable traits
No genetic correlation with birth weight or growth/back fat parameters

(Matheson et al., 2012)

Outdoor lambing flocks?

- Pilot study on 215 Scottish Blackface lambs
- Recorded behaviours at handling (<24h old) and rectal temperature
- Significant relationship between lamb rectal temperature and survival to 8 weeks



Conclusions

- Ewe-lamb bonding behaviours very important for survival
- Low maternal ewes increase lamb mortality, otherwise not strong evidence that quantity of maternal care might increase lamb survival?
- Lamb behaviour independently contributes to lamb survival
- Increasing lamb vigour/activity increases probability lamb will survive
- Actions to improve lamb vigour (management, selection) should improve lamb survival

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