Neonatal lamb behaviour contributes to improved postnatal survival

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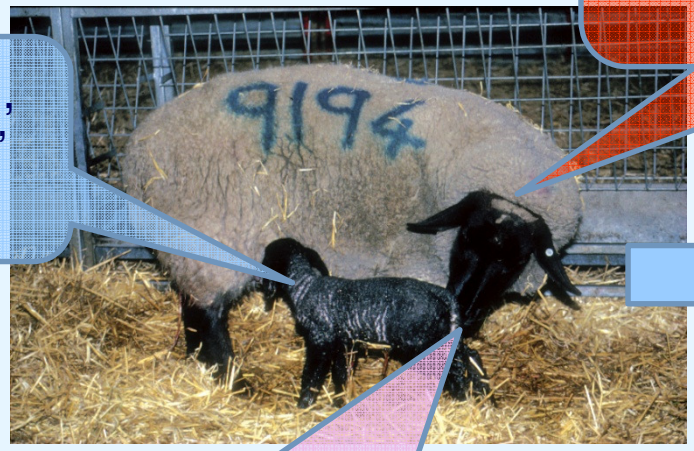
Behaviour and lamb survival

- Most preweaning lamb deaths occur within the first 3 days of life
- Lamb survival is critically dependent on the ewe:
  - to provide nutrition, passive immunity, protection, aid thermoregulation, learning
- Maternal behaviour is important for bonding to lamb
- What about the lamb?

Bonding behaviour at birth

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

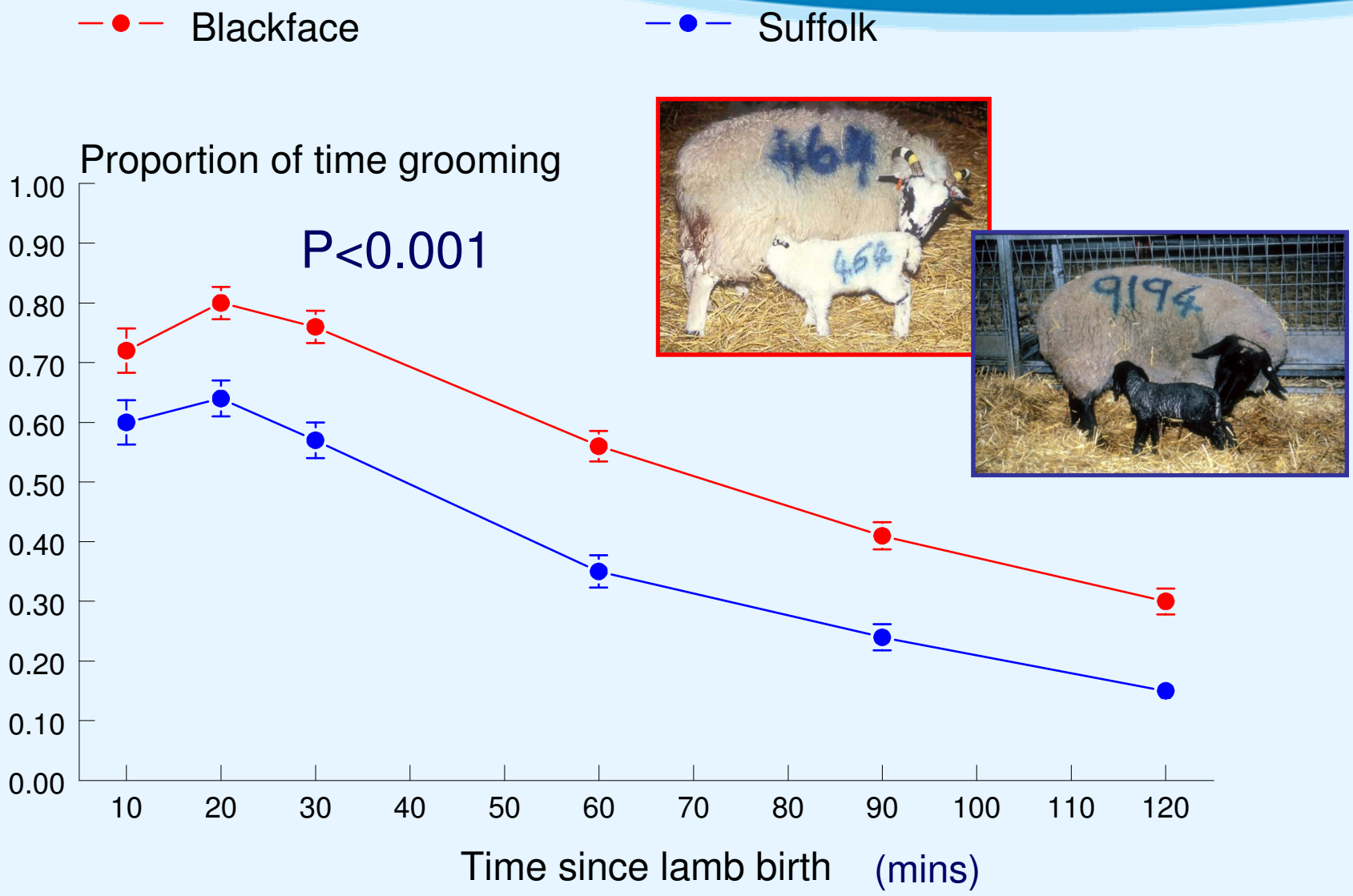
Activity, udder seeking, sucking, 'competence' thermoregulation



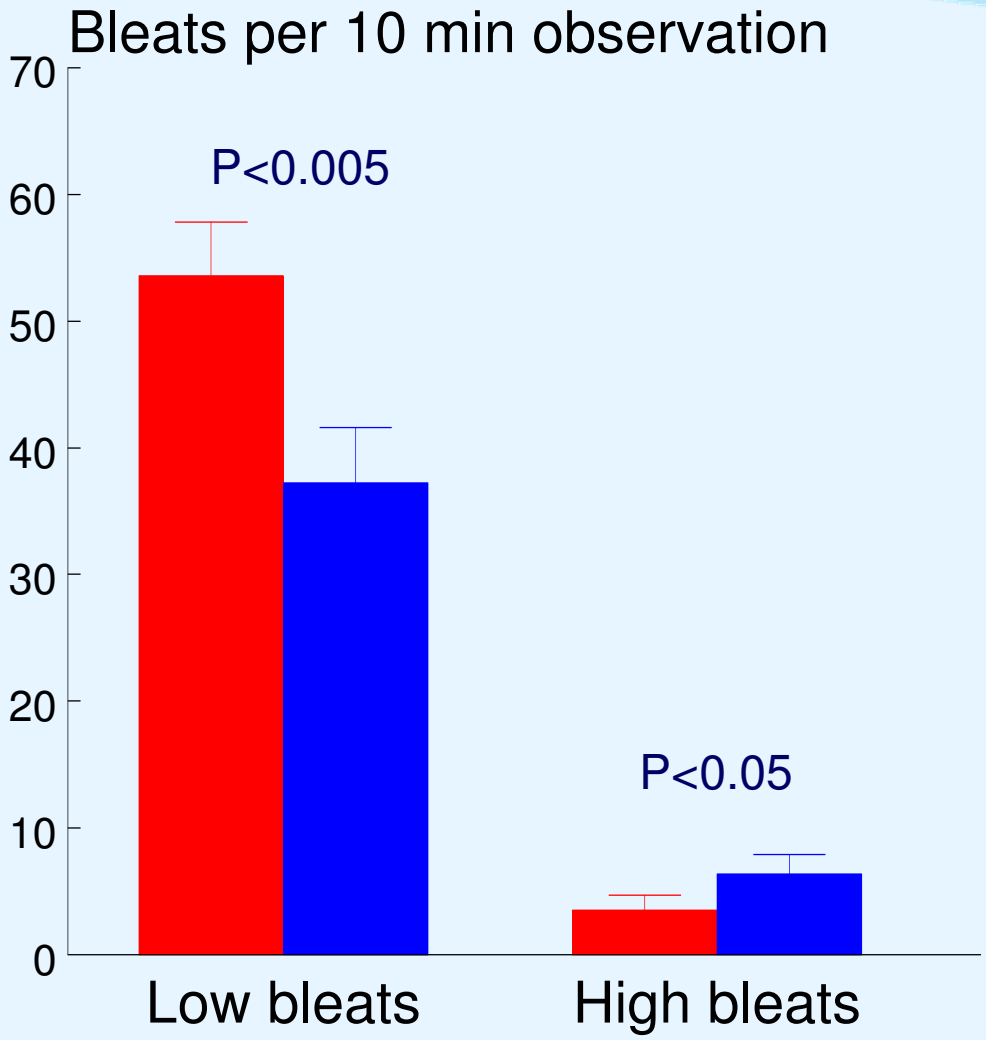
Mutual recognition (all sensory modalities); spatial proximity; sucking interactions; distress at separation;
Maternal vigilance

Improved lamb survival

Differences in maternal behaviour



Differences in maternal behaviour



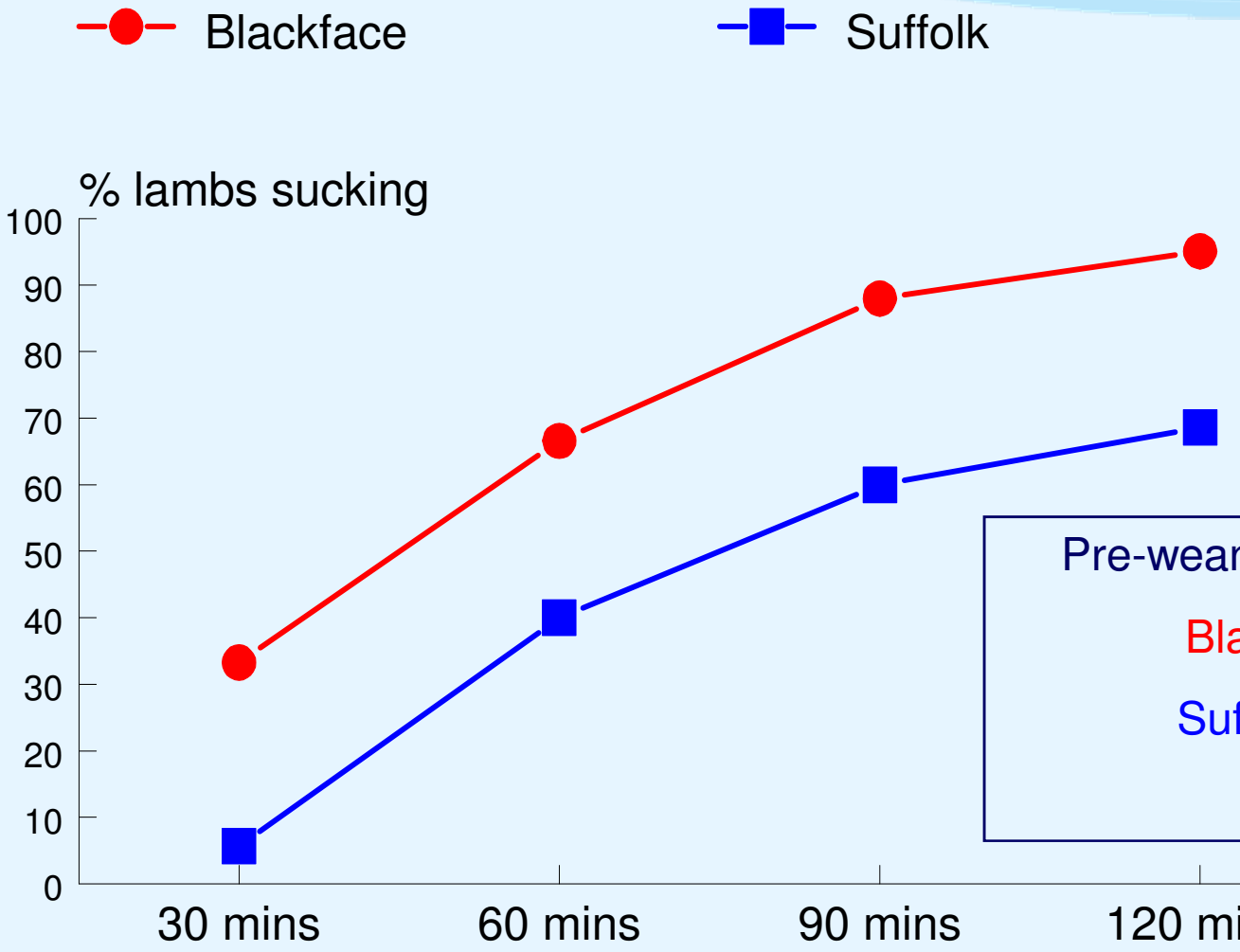
Udder acceptance:

Blackface=0.72 (0.34 – 0.90)

Suffolk = 0.44 (0.00 – 0.81)

P<0.001

Impact on the offspring



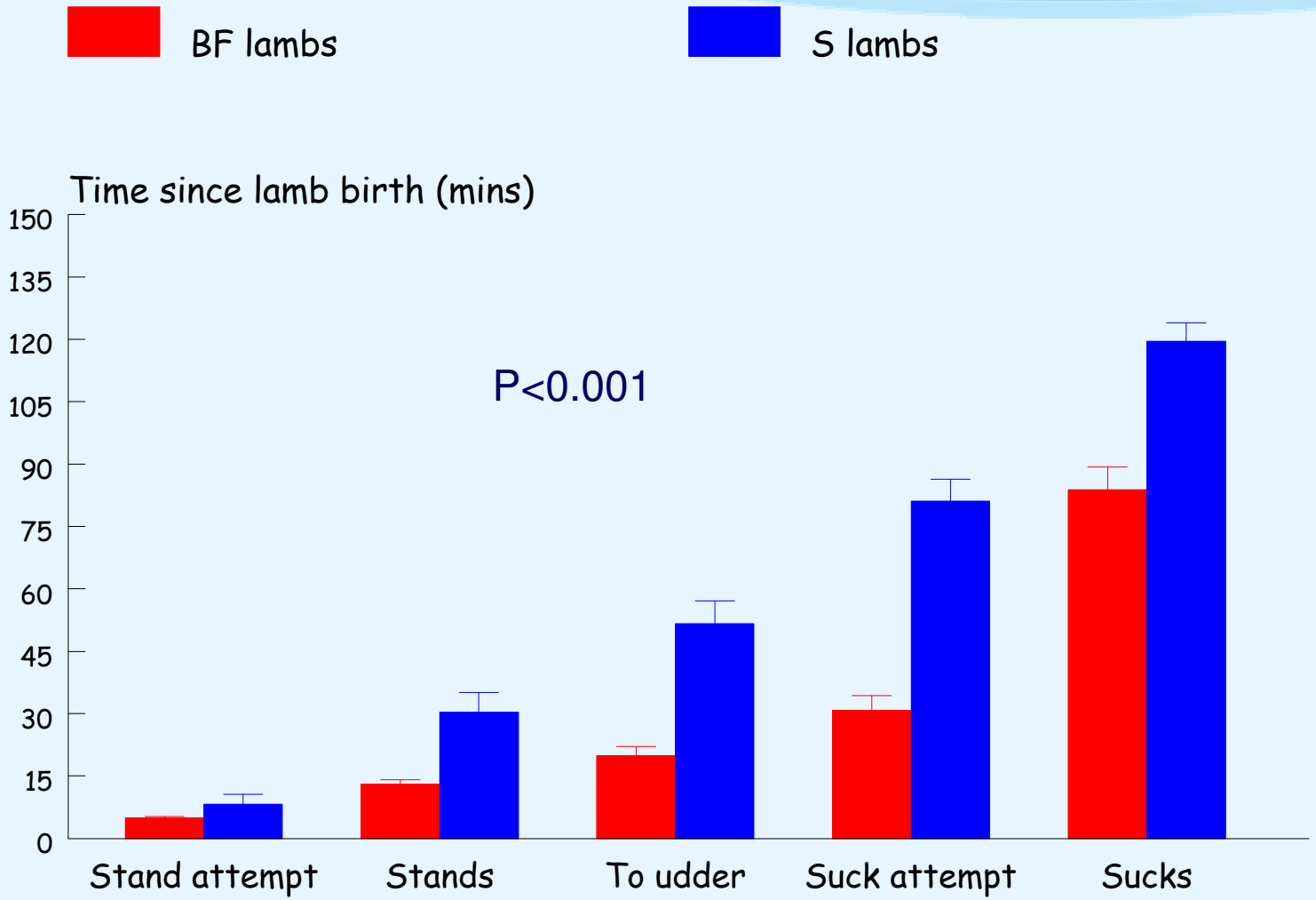
Pre-weaning lamb mortality:

Blackface = 3%

Suffolk = 14%

P<0.001

Breed effects on lamb behaviour

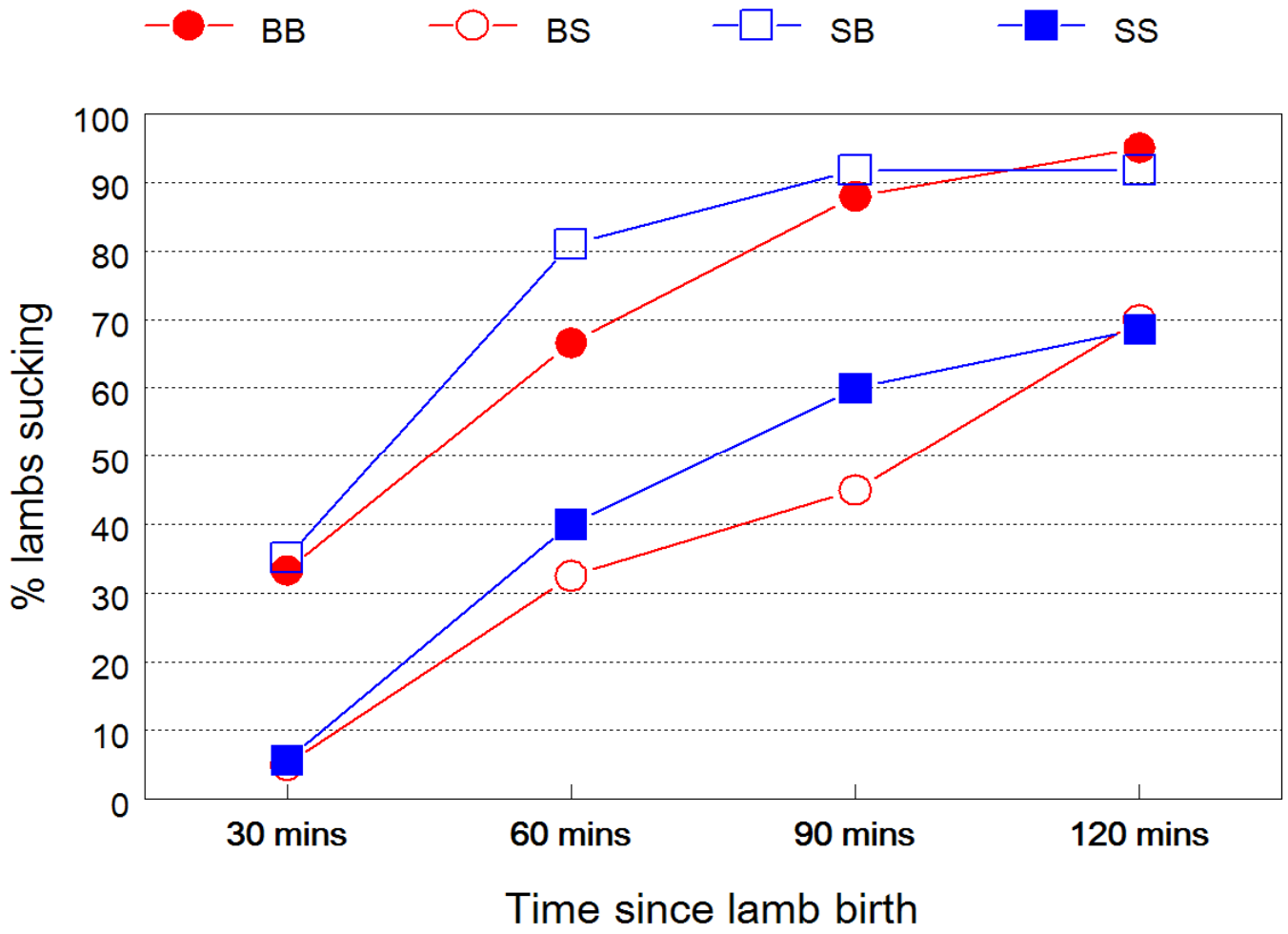


Separate maternal and lamb effects?

- Embryo transfer between breeds
- 4 breed combinations
- Ewes did not ‘recognise’ that this was an alien lamb
- Ewe maternal behaviour was not affected by differences in lamb vigour
- Lamb behaviour not affected by differences in maternal care

(Dwyer & Lawrence, 1999)

ET lamb sucking success



Lamb behaviour and survival

- Data suggest that early lamb behaviour may be independent of maternal care
- Maternal behaviour alone may be insufficient to ensure lamb survival
- How important is lamb behaviour for survival?

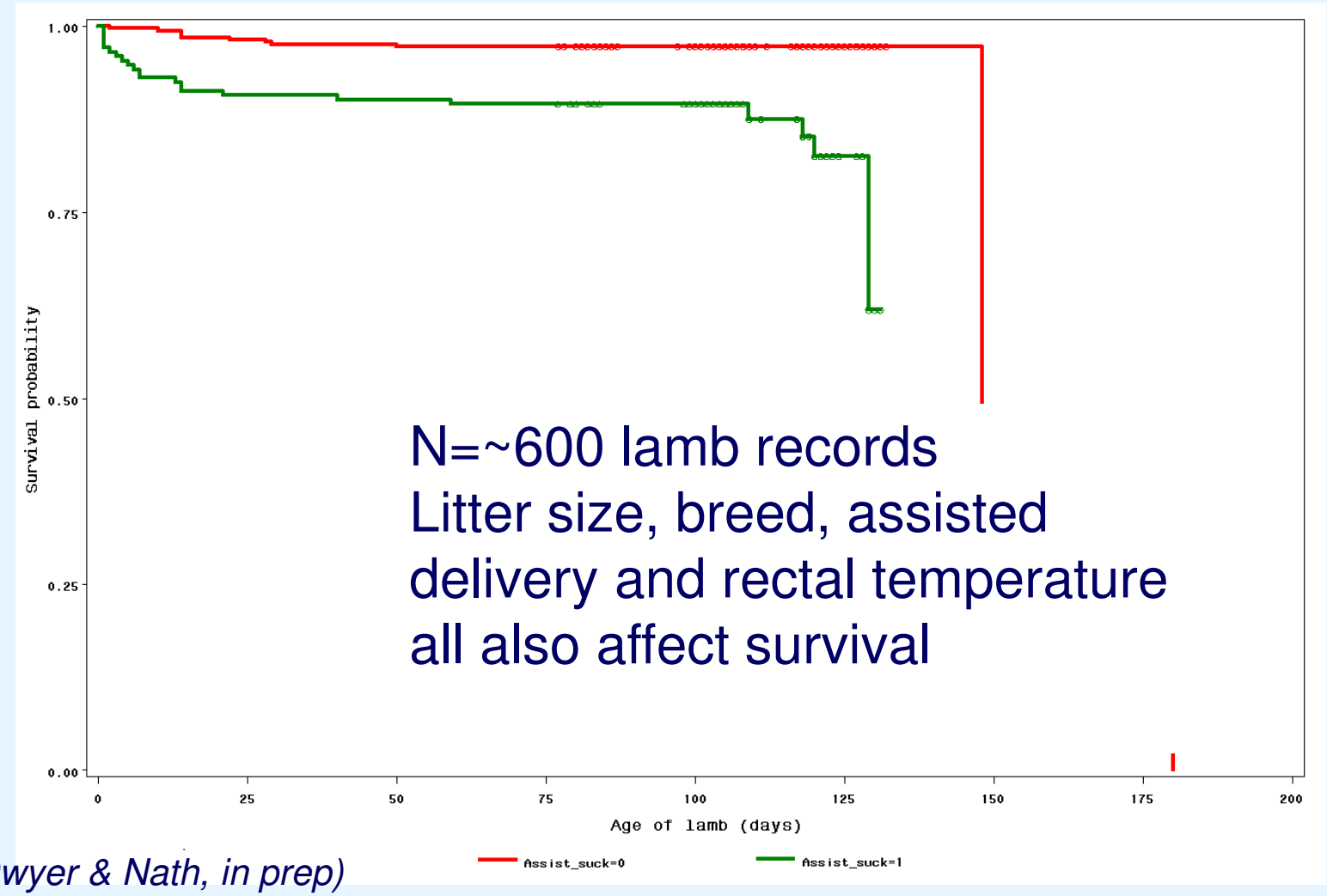
Lamb behaviour and survival

	Stillborn	Died <3d	Died <8 weeks	Survived	P
Birth weight (kg)	1.89^{a}	2.54^{b}	3.04^{bc}	3.17^{c}	<0.001
Time to stand	*	63.8^{a}	25.08^{ab}	16.62^{b}	<0.05
First suck attempt	*	103.4^{a}	38.37^{a}	18.58^{b}	<0.005
First suck	*	*	142.3^{a}	91.87^{b}	<0.05

(Dwyer et al., 2003)

Predictors of lamb survival

Kaplan-Meier survival curve: Assisted to suck



N=~600 lamb records
Litter size, breed, assisted delivery and rectal temperature all also affect survival

(Dwyer & Nath, in prep)

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., in press)

Genetic Parameters

	Birth Assistance	Vigour	Sucking Assistance
Birth Assistance	**0.47 ± 0.067**	-0.34 ± 0.212	0.76 ± 0.149
Vigour	0.16 ± 0.042	**0.14 ± 0.063**	-0.19 ± 0.228
Sucking Assistance	0.20 ± 0.039	0.26 ± 0.040	**0.24 ± 0.046**

~800 Texel lambs (research flock)

(Matheson et al., in prep)

Conclusions

- Lamb behaviour is independent of maternal behaviour immediately after birth
- Lamb behaviour or vigour at birth is associated with improved survivability
- This can be readily recorded on farm using validated scoring systems
- Lamb vigour has moderate heritability and could be used to improve survival

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SAC

Success through **Knowledge**