# Body condition score in hill ewes – what does it tell us about future lamb survival?




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Smarter Sheep meeting – 7th December 2022

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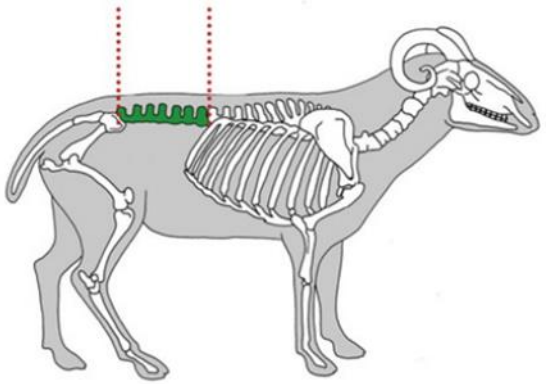
# Overview

- Body condition scoring (BCS) = quick & simple tool farmers can use to monitor and manage their ewes



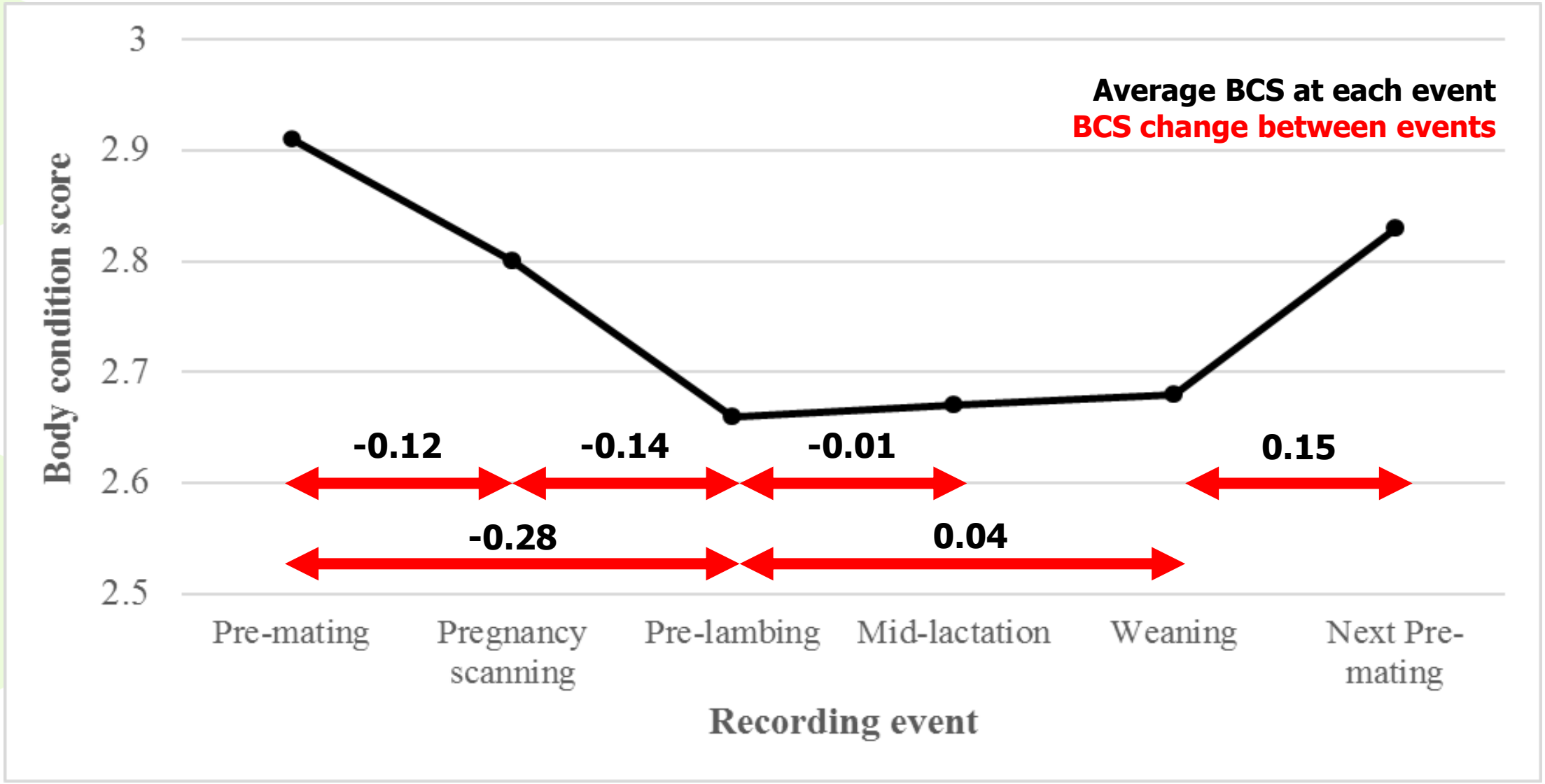
- Objectives
  - Investigate genetic parameters for BCS traits
  - Assess genetic parameters for traits associated with ewe rearing performance
  - Investigate the genetic and phenotypic relationships between BCS and ewe rearing performance

# Materials & methods

- Data available from 8,335 individual Scottish Blackface ewes
  - 2 different extensively managed hill flocks
  - Between 1999 and 2019

- Body condition score data collected at
  - Pre-mating (November) - 23,903 records
  - Pregnancy scanning (February) - 20,691 records
  - Pre-lambing (April) - 14,936 records
  - Mid-lactation (June) - 14,895 records
  - Weaning (August) - 23,127 records

# Body condition scores



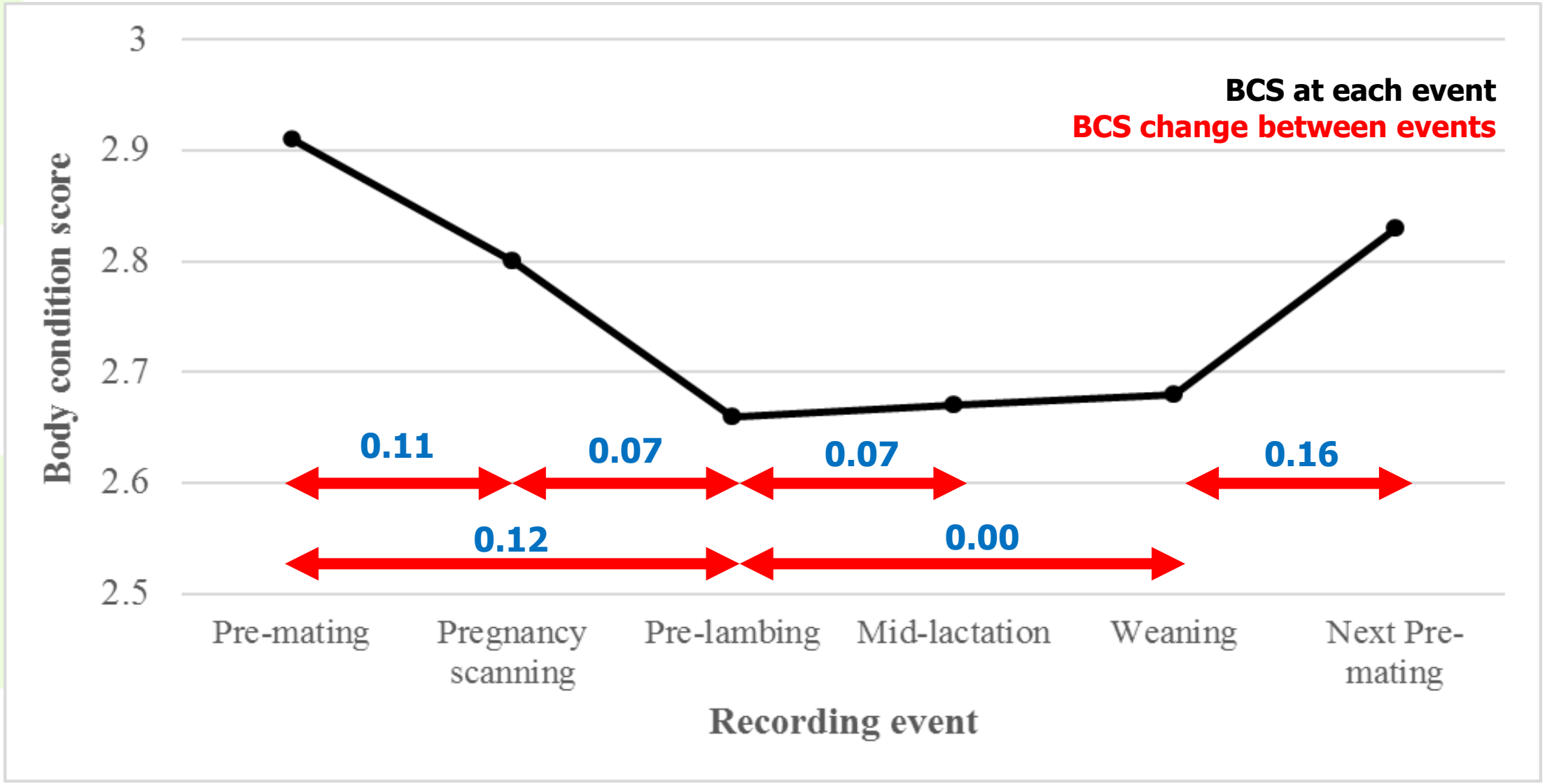
# Genetic analyses

- Body condition score (BCS) traits

| Trait | Heritability |
|---|---|
| Pre-mating BCS | 0.14 |
| Pregnancy scanning BCS | 0.17 |
| Pre-lambing BCS | 0.16 |
| Mid-lactation BCS | 0.10 |
| Weaning BCS | 0.002 |

- Genetic correlations between BCS traits
  - All highly correlated (>0.87) apart from those associated with Weaning BCS.
  - Correlations associated with Weaning BCS not significantly different from 0.

# Body condition score change (heritability)



# Ewe maternal performance

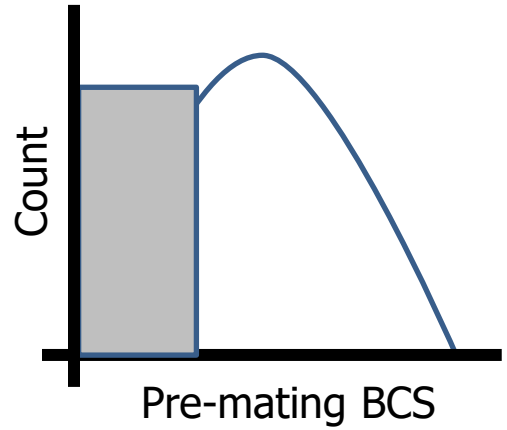
- Traits investigated

| Trait | No. of records | Heritability |
|---|---|---|
| Pregnancy scan result | 25,068 | 0.09 |
| Foetal loss (preg. scan to lambing | 22,293 | 0.02 |
| Lamb loss (lambing to weaning) | 22,105 | 0.02 |
| Lambs weaned | 23,938 | 0.05 |

# Correlations

- Many of the correlations estimated were non-significant.

- However, those that were significant indicate that genetically
  - More lambs at pregnancy scanning and at weaning
    - Associated with lower BCS at pre-mating and pre-lambing
    - Associated with gains in condition between weaning & mating
  - Less lamb losses (foetal and lamb)
    - Associated with lower BCS at pre-mating and lambing
    - Associated with gains in condition between pre-mating & lambing and between weaning and pre-mating



# Conclusions

- BCS traits investigated are heritable
  - with the exception of BCS at weaning.
- Ewes genetically fatter at pre-mating
  - have lower scanning & weaning results
  - experience higher foetal & lamb losses
- Ewes that genetically gain condition between weaning and pre-mating
  - Have higher scanning and weaning results




# Is maternal performance affected by high faecal egg counts in early life?

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# Overview

- Collected from 5,615 Scottish Blackface lambs
- SRUC's Castlelaw Farm (2011-2020)

- Objectives
  - Estimate genetic parameters of
    - Faecal Egg Counts (FEC) traits
      - *Nematodirus*
      - *Strongyles*
      - *Coccidia*
  - Assess relationship with maternal performance

# Overview

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    - Data from ewes at Castlelaw and Kirkton (genetically linked)

# Faecal Egg Count (FEC) traits

- Data collected in July & August

| | Count | Min | Max | Av | S.D. |
|---|---|---|---|---|---|
| **Nematodirus (eggs/g)** | 9,248 | 0 | 6,150 | 210.0 | 383.16 |
| **Strongyles (eggs/g)** | 9,248 | 0 | 37,500 | 735.47 | 943.25 |
| **Coccida (eggs/g)** | 9,248 | 0 | 11,277,600 | 37,222 | 146,832 |

| Trait | Heritability |
|---|---|
| Nematodirus FEC | **0.12** |
| Strongyles FEC | **0.11** |
| Coccida | **0.06** |

- Correlations between traits
  - High genetic correlation between Nematodirus and Strongyle (0.73)
  - Low to moderate genetic correlation between Strongyle and Coccidia (0.30)

# Ewe traits analysed (1999-2020)

- Ewe maternal traits
  - Pre-mating weight – 24,051 records, average 52.0kg
  - Pre-mating body condition score – 23,903 records, average 2.91
  - Total litter weight weaned – 19,396 records, average 39.0kg
  - Number of lambs weaned – 24,086 records, average 1.08

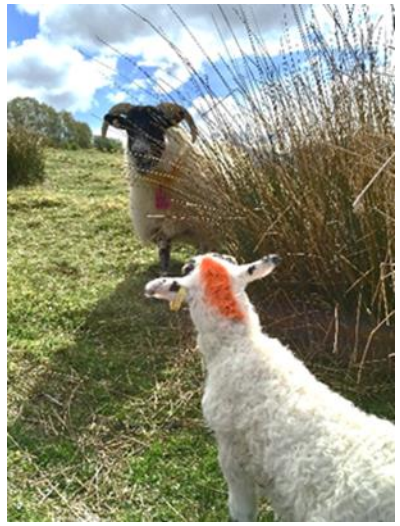
- Productive life traits
  - Age at last productive year – 6,078 records, average 4.2 years old
  - Cumul. litter weight weaned (up to 5 yrs old) – 6,086 records, average 95.0kg
  - Cumul. number of lambs weaned (up to 5 yrs old) – 6,086 records, average 3.5

# Correlations with FEC traits

| | | Nematodirus FEC | | Strongyles FEC | | Coccida | |
|---|---|---|---|---|---|---|---|
| | $h^2$ | *Gen. correlation* | *Phen. correlation* | *Gen. correlation* | *Phen. correlation* | *Gen. correlation* | *Phen. correlation* |
| **PMWT** | **0.38 (0.02)** | ns | ns | ns | ns | ns | 0.03 (0.01) |
| **PBCS** | **0.13 (0.01)** | ns | ns | ns | ns | ns | ns |
| **LWWT** | **0.10 (0.01)** | ns | ns | ns | ns | ns | ns |
| **LWEAN** | **0.05 (0.01)** | ns | ns | 0.28 (0.12) | 0.02 (0.01) | ns | ns |
| **PAGE** | **0.09 (0.02)** | ns | ns | ns | ns | ns | ns |
| **CLWWT** | **0.14 (0.02)** | ns | ns | ns | ns | ns | ns |
| **CLWEAN** | **0.15 (0.02)** | ns | ns | ns | ns | ns | ns |

# Conclusions

- Selection for reduced FEC is possible
- Selection for FECs also confers some resistance to others (e.g. Coccidia)
- Selection for reduced FECs in lambs should have no negative effect on the maternal performance of animals in later life.



# Acknowledgements

- All technical and farm staff involved in data collection

***This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Grant Agreement n°772787***