Lameness evaluations for the UK dairy industry

Fern Pearston

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Data sources

- Lameness events available through Milk Recording Organisations (MROs), NMR and CIS
- Farmer recorded events
- Type and conformation data available from Holstein UK classification records

Genetic parameter estimates – Data

~169 000 animals

~325 000 lameness events

Criteria restrictions;

1. Known sire and dam
2. Sire must have at least 10 daughters in data
3. Oldest 500 daughters retained
4. Drop animals missing heifer type classifications
5. Must have 1st and complete lactations
6. Drop CG without a lameness event
7. Drop CG <5 records

~818 000 contemporaries

~5.9m records

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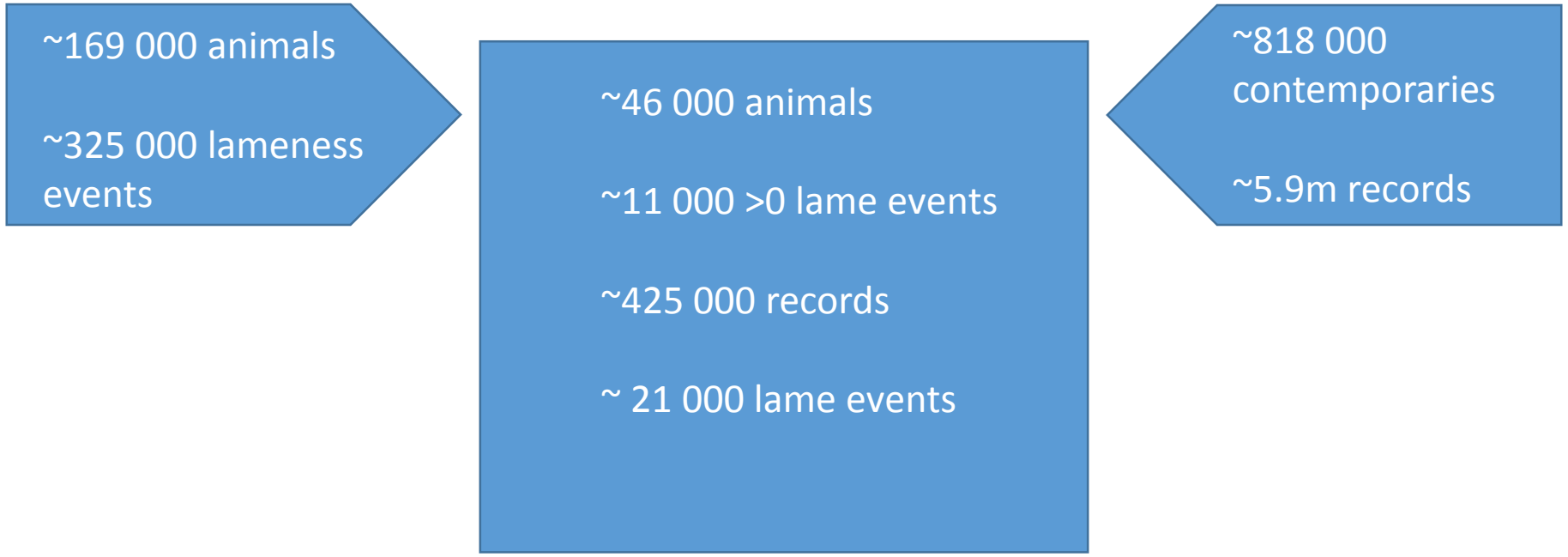
Genetic parameter estimates – Data



Mean no events	Median no events	Range	St Dev	% animals >0 events
0.46	0	0 – 24	1.15	24.2

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Model terms

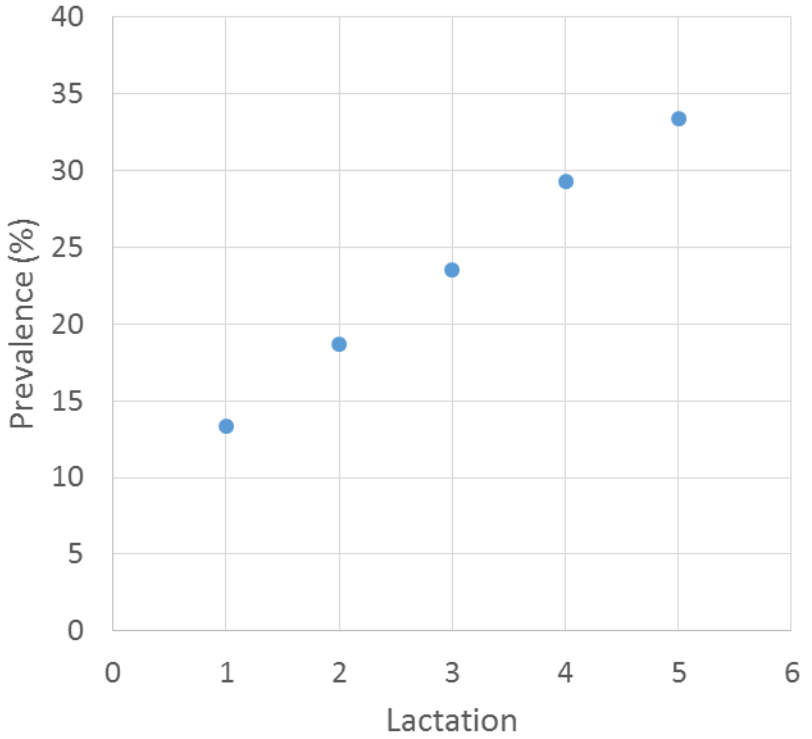
Binary trait, 0 – not lame, 1 – lame

Fixed effects:	Random effects:
Herd test month	Animal
Season of calving	Permanent environment
Days in milk	
Lactation number	
Calving age (nested within lactation)	

Results

Heritability = 0.04

(s.e 0.007)



Previous analysis found;

h^2 =0.08 (s.e 0.01) using sire model and data from one MRO.

EBV estimates - Data

~169 000 animals

~325 000 lameness events

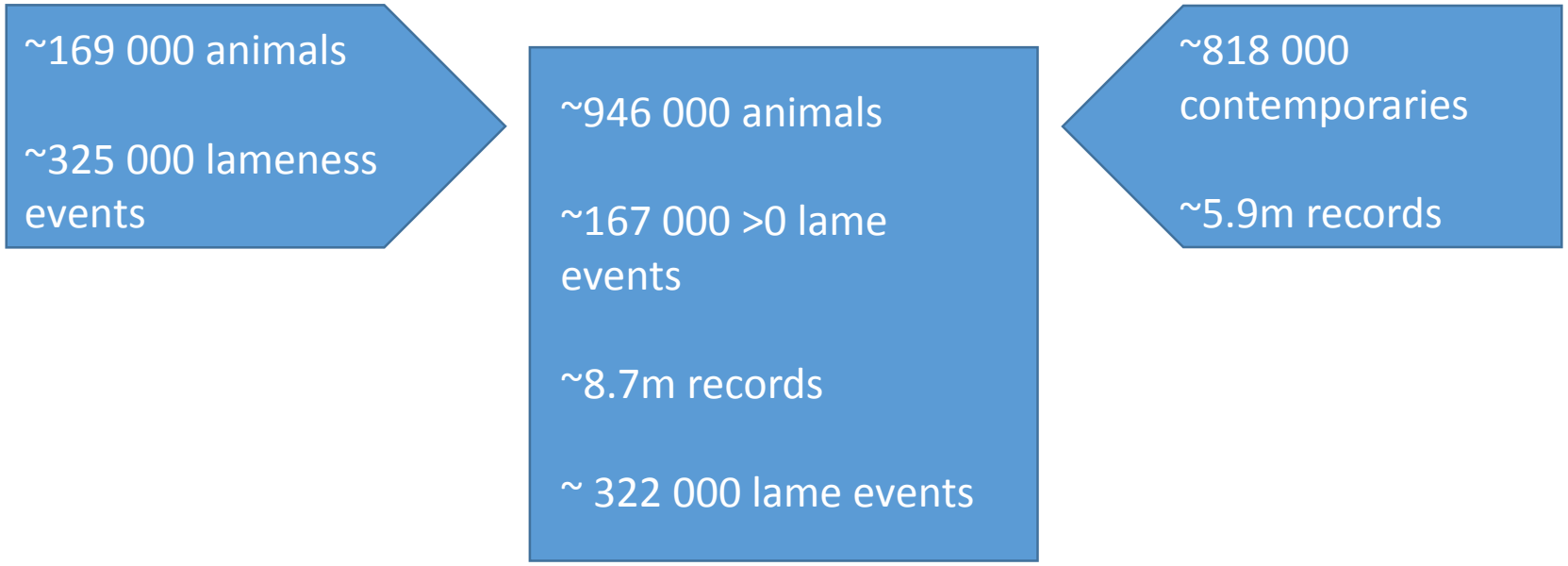
Criteria restrictions;

1. Known sire
2. Drop CG <5 records
3. Drop CG without a lameness event

~818 000 contemporaries

~5.9m records

EBV estimates - Data



Mean no events	Median no events	Range	St Dev	% animals >0 events
0.34	0	0 – 25	1.01	17.6

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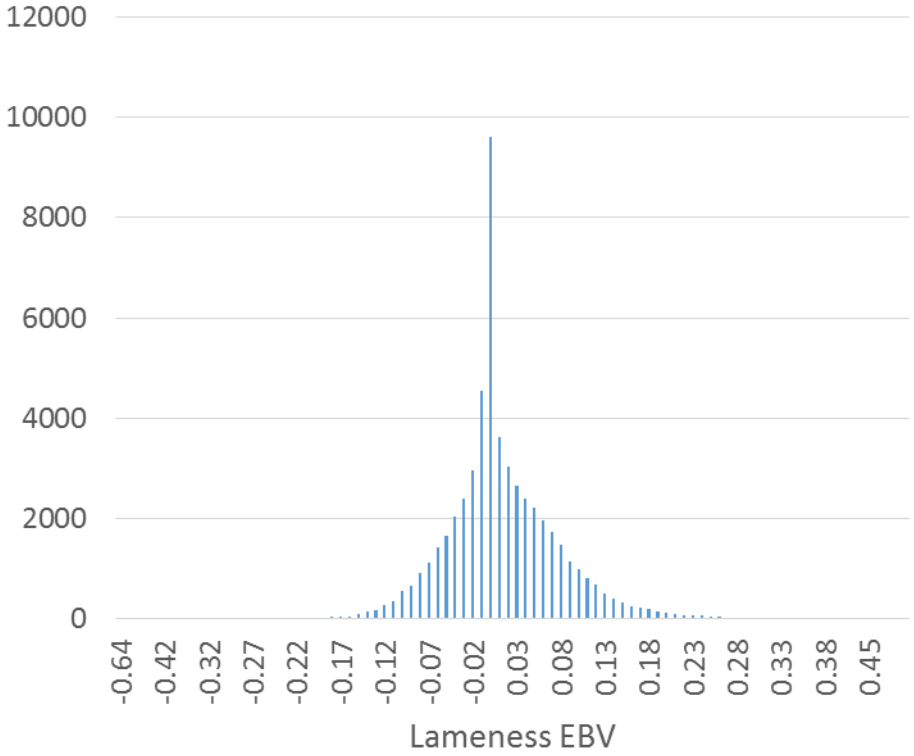
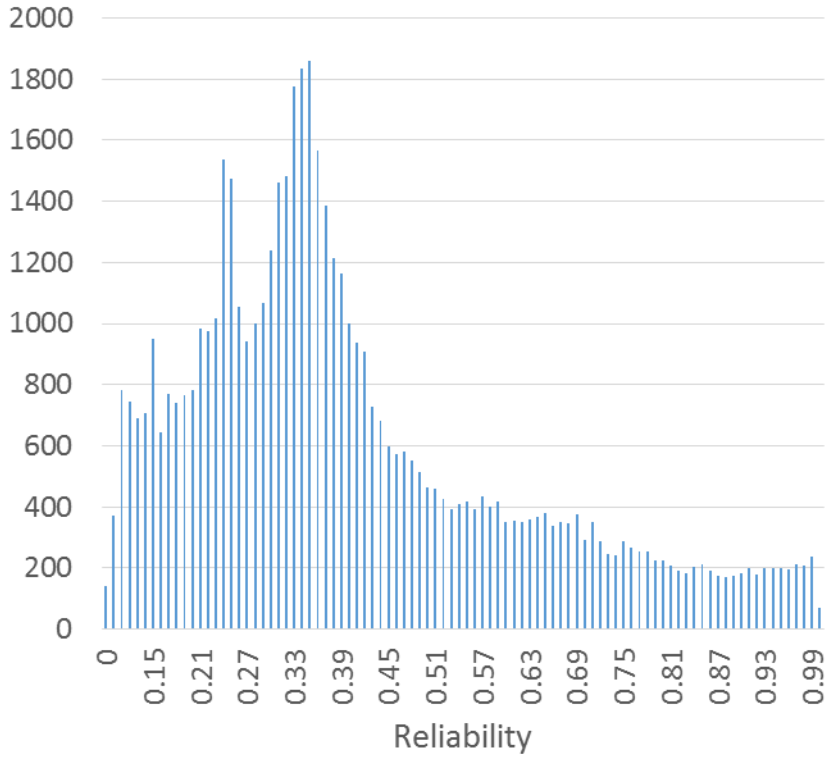
Model terms

Binary trait, 0 – not lame, 1 – lame

Fixed effects:	Random effects:
Herd test month	Animal
Season of calving	Permanent environment
Days in milk	
Lactation number	
Calving age (nested within lactation)	

Results





	EBV	Reliability
Median	0.001	0.35
Range	-0.64 – 0.55	0 – 0.999
St Dev	0.06	0.21

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Results (2) – Phenotypic correlations

	Leg side view	Foot angle	Body condition score	Locomotion	Leg score	Bone quality
Lame lact1	0.026	-0.017	0.013	-0.112	-0.096	-0.036
Lame lact2	0.01	-0.001	-0.015	-0.019	-0.016	-0.02
Lame lact3	-0.008	0.03	-0.044	-0.04	-0.049	-0.001
Lame lact4	0.001	0.018	0.01	-0.003	-0.001	-0.009
Lame lact5	-0.02	0.004	-0.011	-0.009	0.009	-0.009

	Lame lact1	Lame lact2	Lame lact3	Lame lact4	Lame lact5
Lame lact1		0.124	0.114	0.092	0.049
Lame lact2			0.193	0.186	0.153
Lame lact3				0.25	0.164
Lame lact4					0.261

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Next stages of analysis

- Bivariate and multivariate analyses correlating lameness with conformation traits including digital dermatitis
- Hoof trimmer data
  - Multiple sources/recording systems
  - However the data is not standardised and lower volume
- Trait definition – Mastitis
- Genomic evaluations for Lameness;

Over 4 000 sire with genotype and lameness EBV

~3 800 have lameness reliability >30%

~2 800 have reliability >50%

Acknowledgments

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