Genomic breeding values of carcass, female fertility and calf survival traits for UK Limousin Cattle

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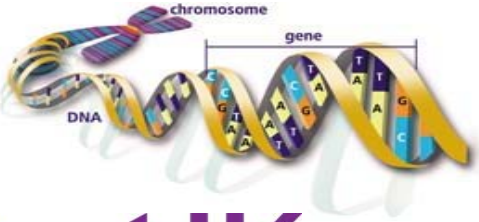
Leading the way in Agriculture and Rural Research, Education and Consulting

VIA carcass traits gEBVs

- 4 year project (2012-2015)
- Limousin genomic breeding values for abattoir VIA carcase traits
- First UK genomic breeding values March 2016



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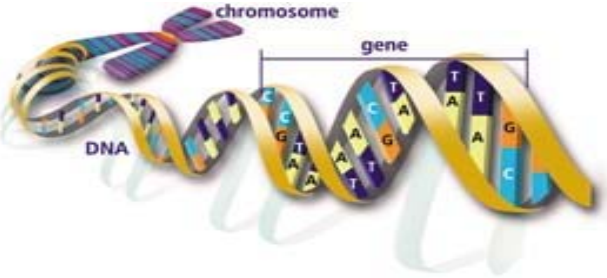
Fertility and survival gEBVs

- 1 year project (2016-2017)
- Limousin genomic breeding values for female fertility and calf survival traits
- gEBVs to be made available 2017



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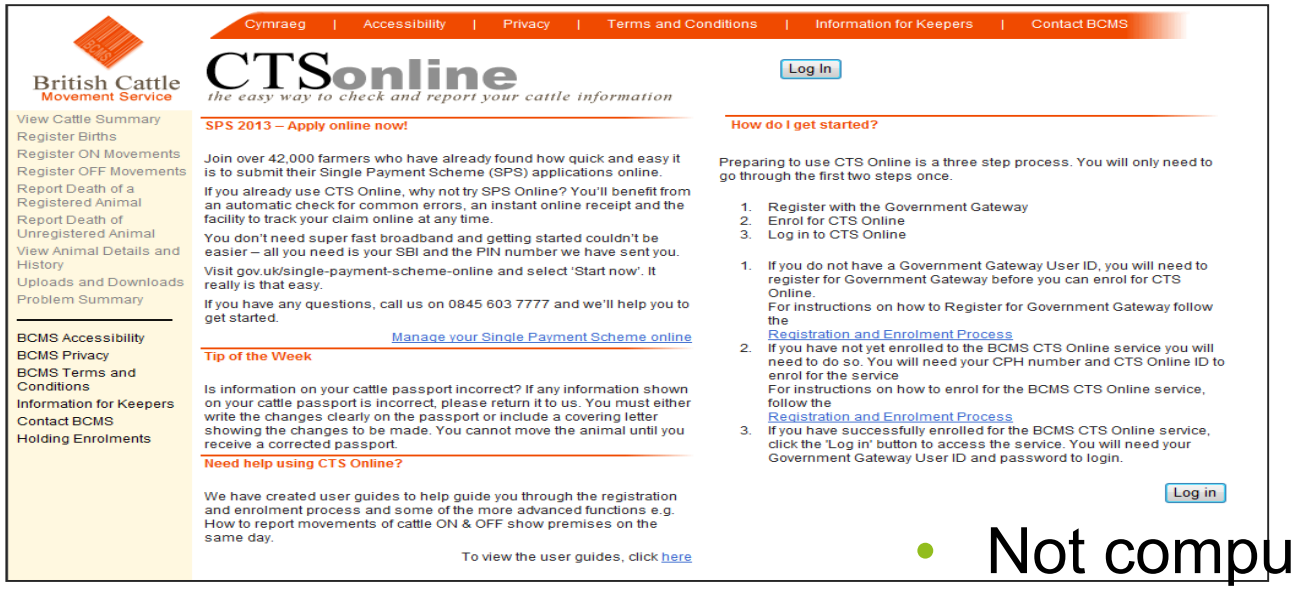
Building the Limousin reference population

- Have > 4,000 Limousin genotypes
  - 716 HD SRUC
  - 960 HD Ireland
  - 2,490 project 50k
  - 200 LD (IDB – 19k)
- Use One-Step approach
  - Allows breeding values to be estimated for genotyped and non-genotyped animals

British Cattle Movement Service

COMMERCIAL animals

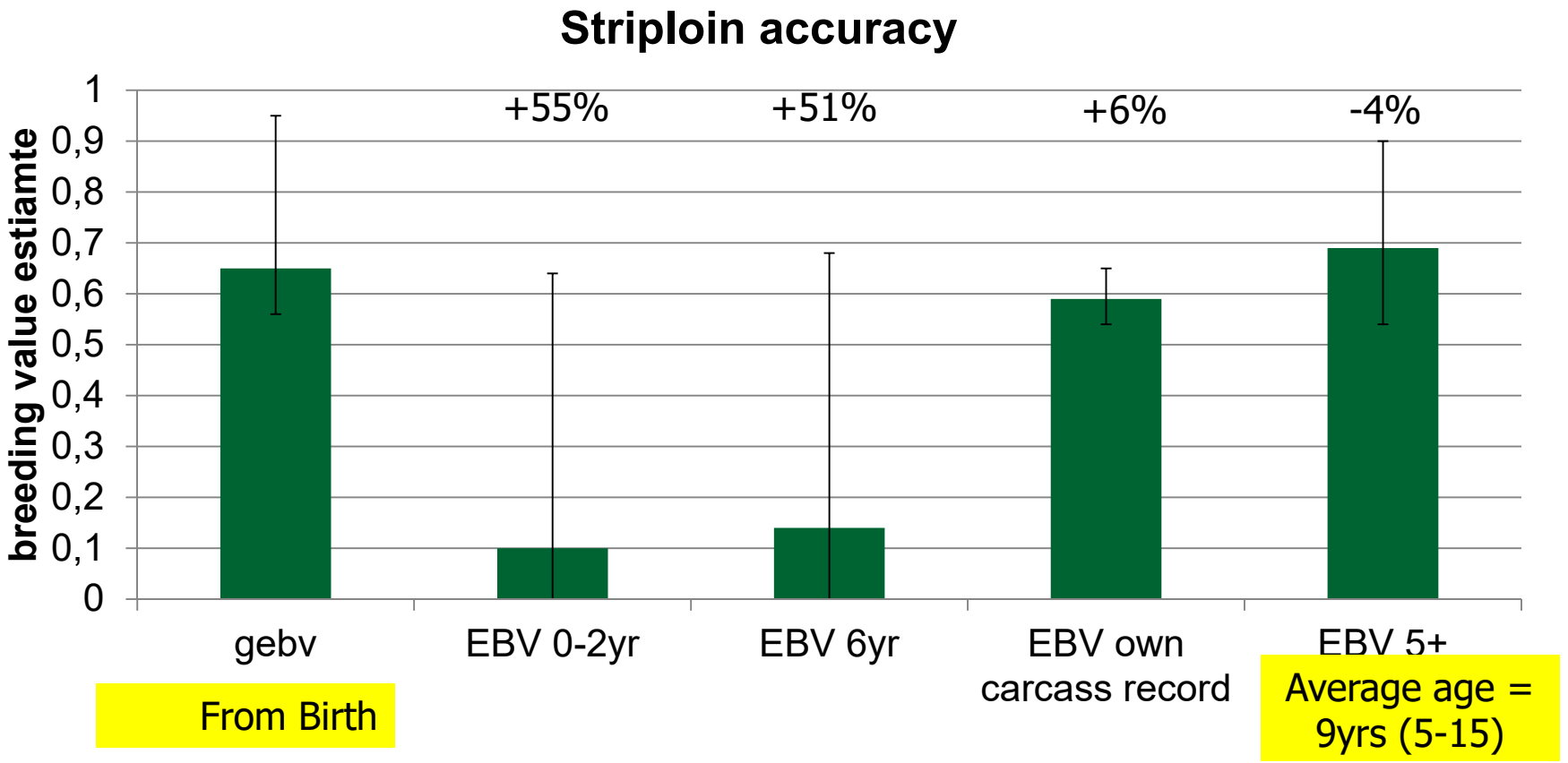


- Information:
  - Dam
  - Breed
  - Date of birth
  - Date of death
  - Movement
- Not compulsory:
  - Sire

Benefits of industry data

- Massive benefit to the industry
  - Large numbers of records – thousands not hundreds
  - Traits of importance £
  - Stronger links in the supply chain
- ‘Super-pedigree’
  - Most complete pedigree in the UK including all bovine
  - BCMS
  - Pedigree (beef and dairy)
  - Milk recording records

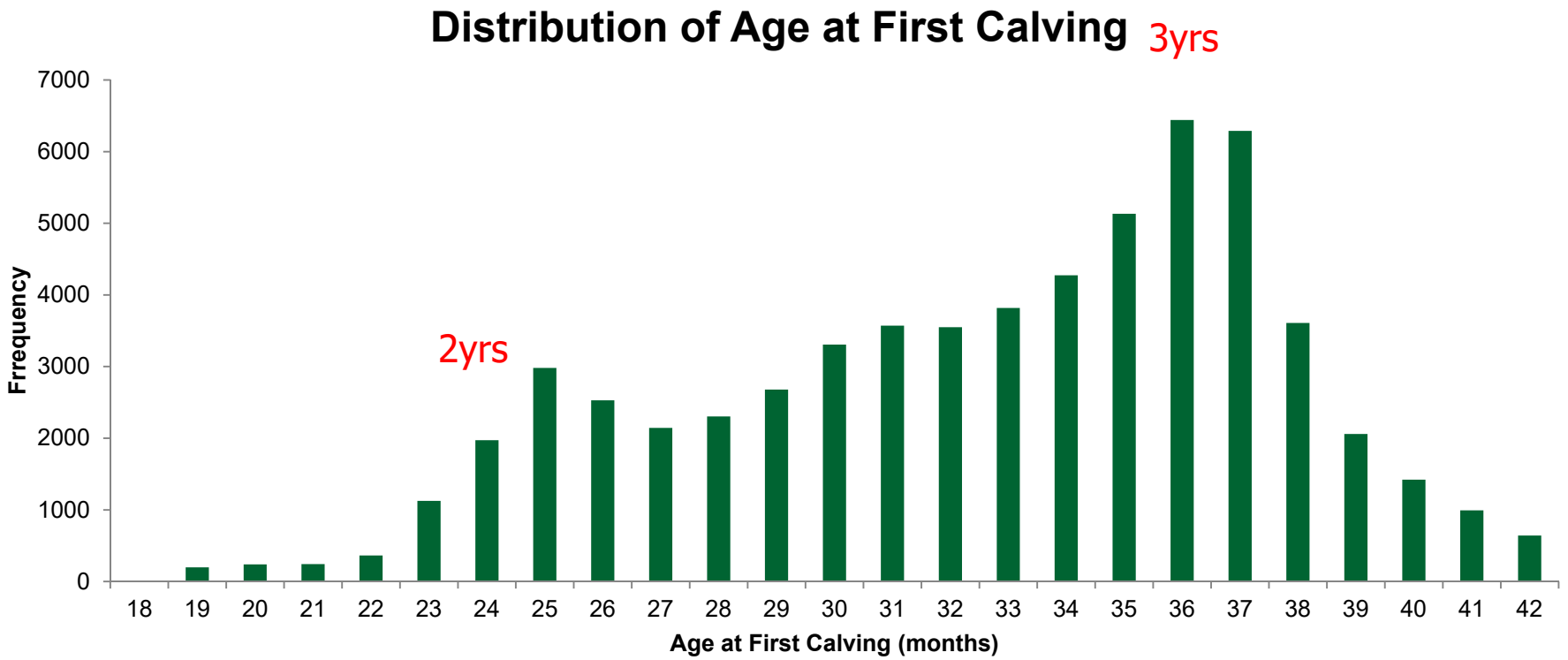
Striploin accuracy



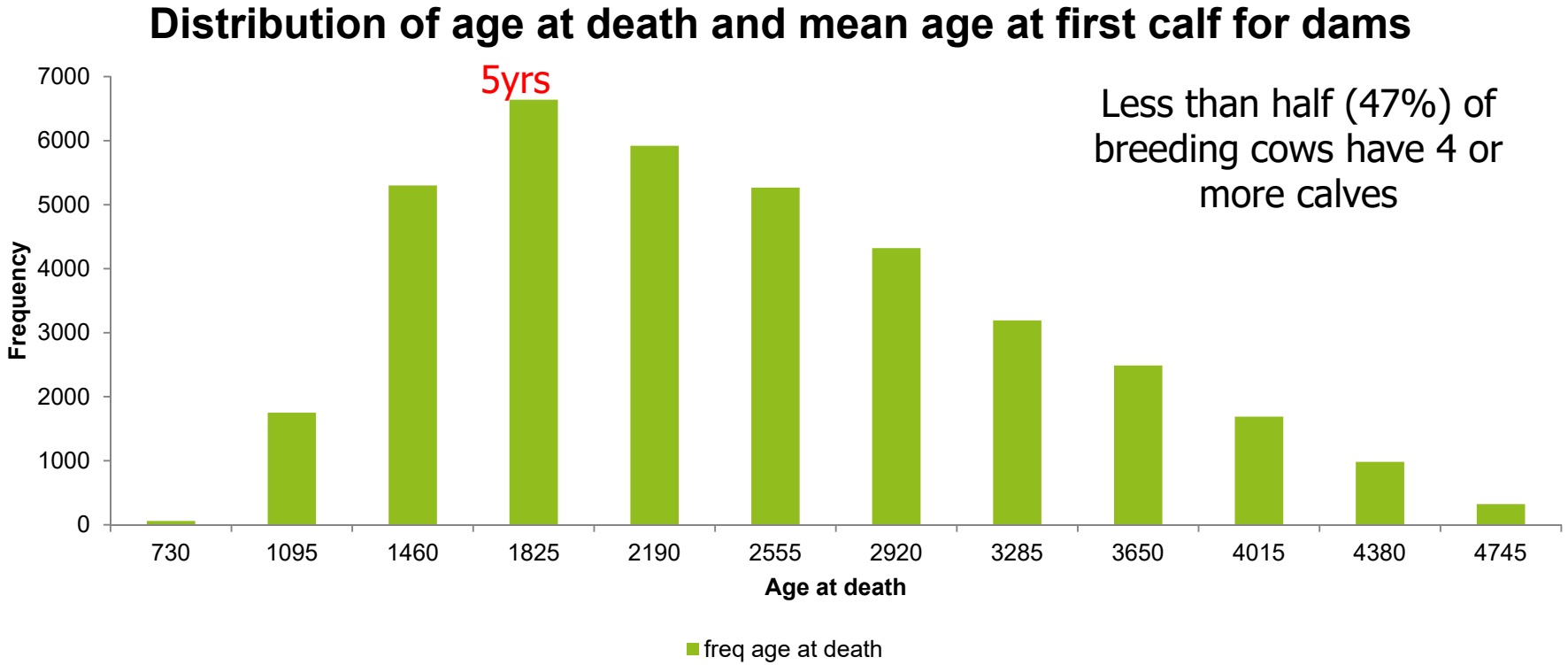
Project Aims

- Using national records (BCMS)
- Produce GEBVs for
  - Age at first calf (age in days at first calf)
    - 548 & 1460 days (18-48m)
  - Lifespan (number of parities when aged 6.5 years)
  - Calving interval (days between 1st and 2nd calf)
  - Calf survival (20 days to 10 months)
- Started with ~12 million animal records (45%+Limousin)

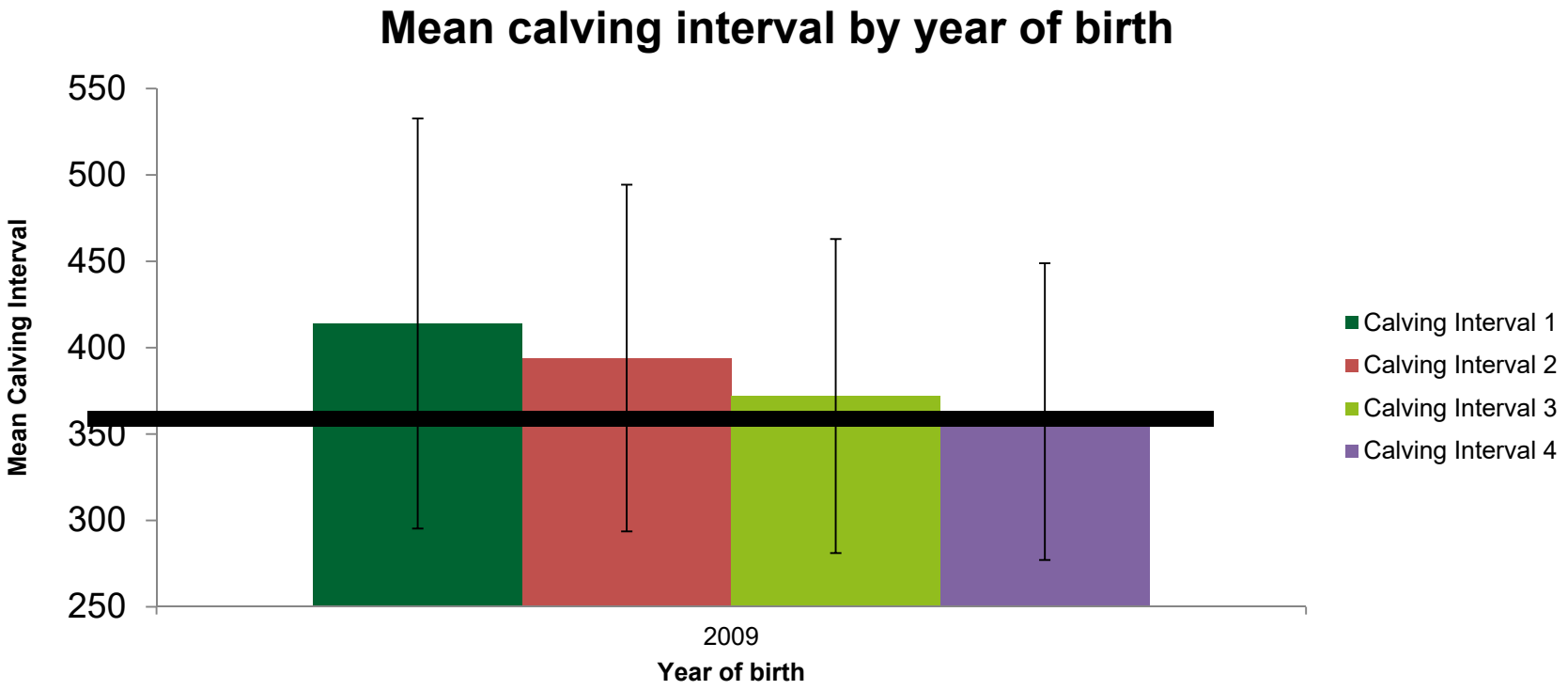
Age at First Calf



Age at death


Distribution of age at death and mean age at first calf for dams
5yrs
Less than half (47%) of breeding cows have 4 or more calves
Frequency
7000
6000
5000
4000
3000
2000
1000
0
730
1095
1460
1825
2190
2555
2920
3285
3650
4015
4380
4745
Age at death
freq age at death

Calving interval



Parameter Estimation

- 12,719,326 BCMS records (45%+ Limousin)
  - 2003 – 2009 born
  - Complete record
  - Sire or maternal grandsire known
- 1,771,907 BCMS records remained
  - 160-180k Female fertility phenotypes
- Removed ET records, small (<5) or single sire CG & outliers within CG
  - AFC Birth herd, year season (6 month) CG
  - CI & LS First calf herd, year season (6 month) CG

Parameter Estimation

Trait	N	Phenotypic variance	Heritability
AFC	58,148	15057 (99.4)	0.13 (0.01)
CI	27,861	10448 (96.0)	0.05 (0.02)
LIFESPAN	34,307	1.191 (0.01)	0.05 (0.01)

Conclusion

- UK are using national datasets for genetic evaluation
- GEBVs implemented for carcass traits
- GEBVs being developed for female fertility and calf survival
  - Parameter estimation for female fertility started
  - Work on models for calf survival started
  - GEBVs expected 2017

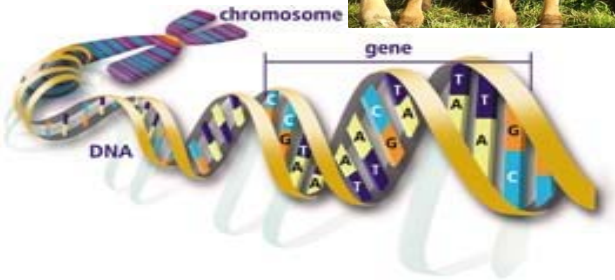
Thank you

SRUC

LIMOUSIN

abp

Food Group



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