Form BEEF

DESCRIPTION OF BEEF NATIONAL GENETIC EVALUATION SYSTEM

Country (or countries) United Kingdom

Trait name: Calving Ease

DATA COLLECTION

Breed(s)	Limousin
Trait definition	Percent of calves born unassisted from 2 year old heifers
Method and frequency of measurement	For each calf born, a calving difficulty score (CDS) is assigned by the breeder
Who does the performance recording?	The breeder assigns the CDS.
Method of collecting data	The CDS ranges from 1 to 5. The farmer assigns a score to each calf born based on the following calving criteria. 1=easy unassisted calving 2=Easy pull 3=Hard pull 4=Vet assistance 5=Caesarean section
Which animals get recorded?	All animals
Is birthday recorded?	Yes
Is day of recording available?	Yes it is the date of birth
Are the data adjusted and/or selected? If yes please describe the methodology applied	Data is not selected with all animals able to be recorded. Recording calving ease in the UK is optional so some herds do not record calving ease. The recorded phenotype is calving difficulty score. However for the analysis the CDS are transformed to normal scores with the CDS 1-5 scores being recoded as -0.2, 1.4, 1.8, 2.1 & 2.6, respectively. The national CE EBVs are expressed as percent easy calving using a threshold value of 1.580030.
Time period for inclusion of records	Calving ease has been recorded since 1970 (although in small numbers). More active recording has occurred since the 1980's
Criteria (data edits) for inclusion of records	CDS needs to be 1,2,3,4 or 5

Is embryo transfer applied? How are ET animals been identified?[1] Is recipient mother ID recorded?	ET does occur, but is not common in the Limousin breed. Both ET and non-ET animals have the same identification system. The recipient dam information can be recorded, although the majority of recipient dams are presently not recorded
How do you treat incomplete data?	To be included in the CE evaluation all animals are required to have birth month, ET status, dam parity and birth type and herd known.

MODEL	
Model used for genetic evaluation[2a]	MT-AM-FR-DAM-MPE
Environmental effects[2b]	Contemporary group: initially defined by herd, then collapsed based on 92 day time periods using the date of birth. Other effects are birth month: 12 levels (F), ET code: 2 levels (F), birth type: 2 levels (F), dam parity: 2 levels (F).
Use of genetic groups and relationships	A standard relationship matrix is formed based on available pedigree information. Genetic groups are based on the animal's year of birth.
Genetic parameters in the model [3]	See appendix
Adjustment for heterogeneous variance in evaluation model	No
System validation	Pre evaluation data quality checks and formation of contemporary groups. Genetic evaluation undertaken using Mix99. Post evaluation checks include adjusting for the genetic base, quality assurance checks and data summaries.
Definition of genetic reference base Next base change	Genetic reference animals are those animals that are born 2 years prior to the evaluation, plus the parents of animals born within the previous 2 years.
Assessment of index quality (computation of reliability, connection)	Reliabilities are computed using the mix99 software using the Mistztal and Wiggans (1988) calculation method.

PUBLICATION	
Expression of genetic evaluations	EBVs are produced and distributed to breeders via Signet
Criteria per official publication of evaluations	No
Number of evaluations / publications per year	3 evaluations are run annually and EBVs produced; March, August and November
Anticipated changes in the near future	None at this stage
Key reference on methodology applied	The mix99 software package is used for the genetic evaluations (Lidauer and Stranden, 1999; Vuori et al., 2006)
Key organization: Contact person, address, phone, fax, e-mail, website	Kirsty Moore Sir Stephen Watson Building Bush Estate, Penicuik Midlothian EH26 0PH Scotland, UK 0131 535 3352 (phone)

0131 535 3121 (fax)
kirsty.moore@sac.ac.uk
www.sac.ac.uk

1) Use Appendix II BEEF for sample ID of ET animals

2a) Use abbreviation listed in the attached list of abbreviation to define the type of model.

2b) Use abbreviation for most common effects as listed in the attached list of
   abbreviation indicating, also, if the effect is treated as random (R) or fixed (F).

3) Use Appendix I BEEF for heritability/genetic variance estimates.

Parameters used in genetic evaluation

Country: United Kingdom
Main trait group: Calving Ease
Breed: Limousin

Trait[1]	Definition	h_d^2	h_m^2	$r_{g(d,m)}$	c^2	σ_p^2
CE	Calving ease (% easy calving)	0.12	0.05	-0.05	0.08	1.01493

h_d^2: direct heritability; h_m^2: maternal heritability; $r_{g(d,m)}$: genetic correlation between direct and maternal effects; c^2: repeatability of (maternal) permanent environmental effects; σ_P^2: phenotypic variance.

1) If you have more than one trait provide the correlations between traits.

Form BEEF

Sample of ET animal IDs

Country: United Kingdom
Main trait group: Calving Ease
Breed: Limousin

ET animal ID
1374604
1435452
1565043
1604555
2736313
2740270
4118260
5053576
7800710
8197045
8211187