Status as of: 2010-08-01

DESCRIPTION OF NATIONAL GENETIC EVALUATION SYSTEMS

Country (or countries)	United States of America
Main trait group	Calving [calving ease (**CE**) – service sire and daughter, stillbirth (**SB**) – service sire and daughter]
Breed(s)	BSW (CE only), HOL (B&W, R&W)
Trait definition(s) and unit(s) of measurement	**CE:** Expressed as percentage of births of bull calves that are difficult in primiparous heifers (**%DBH**), where difficult births are scored as requiring considerable force or being extremely difficult (4 or 5 on a 5-point scale); service-sire CE measures tendency of calves from a particular service sire to be born more or less easily; daughter CE measures ability of a particular cow (daughter) to calve easily **SB:** Expressed as percentage of births of bulls calves that are stillborn in primiparous heifers (**%SB**), where stillborn calves are scored as dead at birth or born alive but died within 48 hours of birth (2 or 3 on a 3- point scale)
Method of measuring and collecting data	In recent years, scores reported almost entirely through Dairy Herd Improvement Affiliates **CE:** Scored by owner on a scale of 1 to 5, where 1 = no problems encountered or unobserved birth and 5 = extreme difficulty **SB:** Scored by owner on a scale of 1 to 3, where 1 = calf born alive and still alive 48 hours after birth, 2 = calf born dead, and 3 = calf born alive but died within 48 hours after birth; scores of 2 and 3 combined into a single category for evaluation
Time period for data inclusion	Calvings from 1980 and later
Age groups (e.g. parities) included	All parities
Other criteria (data edits) for inclusion of records	No multiple births; sire age of >18 months or <18 years on calving date; MGS age of <18 years on dam birth date; no herds with a single calving record or only difficult CE scores for Brown Swiss or Brown Swiss-Holstein crossbreds,. **CE:** Data from herd-years with abnormal score distributions excluded (about 3% of data) based on a goodness-of-fit statistic for multinomial score distribution **SB:** Herds with <10 reported calf deaths in database excluded
Criteria for extension of records (if applicable)	None
Sire categories	All sires (AI and NS) evaluated together
Environmental effects, pre-adjustments	None
Method (model) of genetic evaluation	ST threshold sire-MGS model; CE and SB evaluated separately

Environmental effects[3] in the genetic evaluation model	Year-season (F), parity-sex (F), sire-MGS birth year group (F), MGS breed (F; CE only) (F), HY (R)
Adjustment for heterogeneous variance in evaluation model	None
Use of genetic groups and relationships	Inverse of relationship matrix calculated using sire, MGS, and sire-MGS birth year effects
Blending of foreign/Interbull information in evaluation	None
Genetic parameters in the evaluation	See Appendix CA for h^2 estimates **CE:** Sire variance, 0.022; MGS variance, 0.016; sire-MGS covariance, 0.009 **SB:** Sire variance, 0.008; MGS variance, 0.018; sire-MGS covariance, 0.004
System validation	Means and SDs for all variables calculated and examined overall as well as for each data submission; means for new bulls, changes for high bulls, largest changes, and key statistics for recent AI bulls checked
Expression of genetic evaluations	**CE:** %DBH **SB:** %SB Values from underlying scales reported to Interbull
Definition of genetic reference base **Next base change**	HOL: Direct, bulls born in 2005; maternal, bulls born in 2000 BSW (CE only): Direct, bulls born between 2001 and 2005; maternal, bulls born between 1996 and 2000 April 2015
Calculation of reliability	Approximated by inverse of diagonal element of coefficient matrix
Criteria for official publication of evaluations	Bull from AI organization that supports calving trait evaluation
Number of evaluations/ publications per year	3 (April, August, December)
Use in total merit index[4]	**CE:** 1.25% (HOL) and 1.5% (BSW) for service sire and 0.75% (HOL) and 1.5% (BSW) for daughter of total for net merit dollars* (**NM$**); 2% for daughter in Total Performance Index (**TPI**, HOL) **SB:** 0.75% for service sire and 2.25% for daughter of total for NM$* (HOL); 1% for daughter in TPI (HOL) *Calving traits included in NM$ as calving ability dollars (**CA$**) index with 5% (HOL) and 3% (BSW) of total emphasis
Anticipated changes in the near future	None

Key reference on methodology applied	Van Tassell, C.P., and G.R. Wiggans. 2002. Enhancing quality of dystocia data by integration into a national dairy cattle production database. Proc. 7th World Congr. Genet. Appl. Livest. Prod. 32:557–560. Wiggans, G.R., C.P. Van Tassell, J.C. Philpot, and I. Misztal. 2002. Comparison of dystocia evaluations from sire and sire-maternal grandsire threshold models. Proc. 7th World Congr. Genet. Appl. Livest. Prod. 32:561–564. Wiggans, G.R., I. Misztal, and C.P. Van Tassell. 2003. Calving ease (co)variance components for a sire-maternal grandsire evaluation model. J. Dairy Sci. 86:1845–1848. Van Tassell, C.P., G.R. Wiggans, and I. Misztal. 2003. Implementation of a sire-maternal grandsire model for evaluation of calving ease in the United States. J. Dairy Sci. 86:3366–3373. Cole, J.B., R.C. Goodling, Jr., G.R. Wiggans, and P.M. VanRaden. 2005. Genetic evaluation of calving ease for Brown Swiss, Jersey, and Holstein bulls from purebred and crossbred calvings. J. Dairy Sci. 88:1529–1539. Cole, J.B., G.R. Wiggans, and P.M. VanRaden. 2007. Genetic evaluation of stillbirth in United States Holsteins using a sire-maternal grandsire threshold model. J. Dairy Sci. 90:2480–2488. Cole, J.B., G.R. Wiggans, P.M. VanRaden, and R.H. Miller. 2007. Stillbirth (co)variance components for a sire-maternal grandsire threshold model and development of a calving ability index for sire selection. J. Dairy Sci. 90:2489–2496.
Key organisation: name, address, phone, fax, e-mail, web site	Animal Improvement Programs Laboratory Agricultural Research Service, U.S. Dept. of Agriculture Bldg. 005, Room 306, BARC-West 10300 Baltimore Ave. Beltsville, Maryland 20705-2350, USA Voice: 301-504-8334; Fax: 301-504-8092 E-mail: aipl.inquiry@ars.usda.gov web site: http://aipl.arsusda.gov

Form GE   **Appendix CA**

Parameters for national genetic evaluations for calving traits as provided to Interbull

Country (or countries):   United States of America

Main trait group: Calving Traits [Service-sire and daughter CE, service sire and
                                daughter SB]

Breed(s):   BSW (CE only), HOL (B&W, R&W)

Trait	h^2	Genetic variance	Official proof standardisation formula[a]
Direct CE	0.086		
Maternal CE	0.048		
Direct SB	0.030		
Maternal SB	0.065		

[a] Expressed as follows:
StandEval = ((Eval − a)/b) × c + d, where a = mean of base adjustment, b = SD of base, c = SD of expression (include sign if scale is reversed), and d = base of expression.