Brown Swiss and Holstein Calving Ease

USDA

AIPL RESEARCH REPORT CE1 (1-05)

J.B. Cole

Animal Improvement Programs Laboratory, ARS-USDA, Beltsville, MD 20705-2350
301-504-8334 (voice) ~ 301-504-8092 (fax) ~ jcole@aipl.arsusda.gov ~ http://aipl.arsusda.gov/

Model Changes || Genetic Bases || Model Validation || Acknowledgments

The calving ease (**CE**) evaluation has been extended to accomodate the joint evaluation of Brown Swiss (**BSW**) and Holstein (**HOL**) bulls using records from purebred BSW and HOL and crossbred BSW-HOL calvings. Beginning in February 2005 BSW bulls will receive routine CE evaluations. The data set includes 12,078,136 purebred HOL calving records, 15,920 purebred BSW calving records and 6,312 crossbred records for BSW-HOL F1 calves born since 1998.

Model Changes

The joint evaluation model is described in detail in a separate document, "USDA Calving Ease Evaluation". Separate bases are used for BSW and HOL bulls. Brown Swiss bulls have lower mean phenotypic and genetic values than HOL bulls for the percentage of difficult births in heifers (**%DBH**) than HOL. Results suggest that BSW sires may produce daughters that have less calving dificulty (dystocia) than HOL sires. Predicted transmitting abilities for HOL sires have higher mean reliabilities, as expected, because there are many more HOL than BSW data.

Breed	Bulls	Service Sire Calving Ease (SCE)				Rel SCE				Daughter Calving Ease (DCE)				Rel DCE			
		Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
BSW	681	5.19	0.91	3	9	56.38	12.39	35	98	4.55	0.70	2	8	54.09	11.87	36	98
HOL	42185	7.47	1.43	2	21	63.70	13.71	30	99	8.85	1.29	5	18	57.64	11.68	25	99

Genetic Bases

Details on the genetic base change for HOL may be found in the document "Genetic Base Changes for February 2005". Genetic bases are defined separately for each breed. The HOL bases are computed from evaluations of bulls born in 2000 for SCE and in 1995 for DCE and are set to the average %DBH for mates or daughters, respectively. Due to the sparsity of available data the BSW bases are set to the mean %DBH for all available BSW calvings. Adequate data to define separate bases for each trait, as in HOL, should be available at the 2010 base change.

Breed	DCE Base	SCE Base
BSW	5.19	5.19
HOL	7.99	8.47

Model Validation

The joint evaluation model was validated by comparison against results from BSW-only and HOL-only evaluations. Correlations show that HOL bulls received virtually identical evaluations under both models. There are small differences in the ranking of some HOL bulls for daughter calving ease (**DCE**) which are attributable to rounding when converting from the underlying scale used by the threshold model (**Sol**) to the reported values. The re-ranking among BSW for sire calving ease (**SCE**) and DCE indicates that HOL contemporaries of BSW-sired F1 (BSW-HOL) calves used in the evaluation are providing information that is useful for computing BSW bull proofs.

Breed	Product-moment Correlations				Rank Correlations			
	Sol	MGS Sol	PDB	MGS PDB	Sol	MGS Sol	PDB	MGS PDB

| BSW | 0.949 | 0.889 | 0.844 | 0.795 | 0.900 | 0.827 | 0.816 | 0.779 |
| HOL | 0.999 | 0.999 | 0.999 | 0.999 | 0.999 | 0.999 | 0.992 | 0.970 |

Joint evaluation results were also validated by Interbull genetic trend testing procedures. Results met Interbull requirements for inclusion in the routine international HOL evaluation for CE. Brown Swiss results were submitted for use in the October 2004 Interbull pilot study of CE in breeds other than HOL.