**Form GE**

Status as of: 2014-11-16

**DESCRIPTION OF NATIONAL GENETIC EVALUATION SYSTEMS**

|  |  |  |
| --- | --- | --- |
| **Country (or countries)** | Israel | |
| **Main trait group1** | Health | |
| **Breed(s)** | Holstein | |
| **Trait definition(s) and unit(s) of measurement2** Attach an appendix if needed | Lactation mean somatic cell score (SCS) corrected for environmental factors  SCS = 3 + log2(cells per microliter/100) |
| **Method of measuring and collecting data** | Milk samples are sent to the central lab monthly for somatic cell analysis by fossometric. At communal herds samples are collected by milk inspectors. At with < 150 milking cows the farmer collects the samples. |
| **Time period for data inclusion** | Calvings since 1985. |
| **Age groups (e.g. parities) included** | Parities 1 through 5 are included. Records are multiplicatively adjusted to fourth parity and an additive parity effect is included in the model. Later parities are included only if there are valid records for all previous parities. All parities are weighted equally. |
| **Other criteria (data edits) for inclusion of records** | Sire and herd number, and valid cow birth and calving dates are required. Calving age must be between 609 and 2555 days. At least 2 valid SCS records per parity with the first record within 65 days in milk, and the final record after 34 days in milk. Cows with > 0 and < 30 days open are deleted. |
| **Criteria for extension of records** (if applicable) | Cows with the last valid record < 305 days in milk, and no dry date. |
| **Sire categories** | The numbers of bulls born since 1980 in each category are given in parenthesis after each group: young Israeli Holstein bulls (908), proven Israeli Holstein bulls (325), young “promising” Israeli Holstein bulls (30), foreign Holstein proven bulls (247), breeds other than Holstein (122), and sires of foreign bulls with no local daughters (7). Young “promising” bulls are used more widely than normal young bulls. About 20% of young bulls are from ET. All insemination is AI. |
| **Environmental effects3, pre-adjustments** | All adjustments are fixed. Adjustments factors are linear for days in milk, calving age and month, and parity. All adjustments are to fourth-parity December calvings, for cows 60 months old with zero days in milk. Last update in August, 2012. Reference:  Weller, J. I. and Ezra, E. (1997) Genetic analysis of somatic cell concentration and female fertility of Israeli Holsteins by the individual animal model. *J. Dairy Sci*. 80; 586-594. |
| **Method (model) of genetic evaluation3** | Multitrait AM for each trait. Each trait is analyzed separately. The individual parity evaluations are combined into a single total evaluation (EVT) by the following equation:  EVT = (EV1 + 0.73\*EV2 + 0.51\* EV3 + 0.34\* EV4 + 0.21\* EV5)/2.79  Where EV1-EV5 are the individual parity evaluations. |
| **Environmental effects3 in the genetic evaluation model** | Herd-year-season, discontinuous, 40,844 levels (F), parity by management group, discontinuous, 30 levels (F) |
| **Adjustment for heterogeneous variance in evaluation model** | No |
| **Use of genetic groups and relationships** | Relationship matrix is not modified. Individuals with unknown parents are groups by sex of animal, birth year, and which parents are unknown. |
| **Blending of foreign/Interbull information in evaluation** | No |
| **Genetic parameters in the evaluation** | Use Appendix GE for heritability/genetic variance estimates; for multiple-trait genetic evaluations, provide genetic correlation estimates between traits separately.  Use **also** appendices PR, CO, BCO, SM, LO, CA, as applicable, if you participate in the international genetic evaluations of Interbull |
| **System validation** | Method 1 and 3 |
| **Expression of genetic evaluations** If standardised (e.g. RBV), give standardisation formula in the appendix | ETA, in SCS units, relative to genetic base |
| **Definition of genetic reference base**  **Next base change** | Mean genetic value of all cows with valid production records born in 2005.  Next base change in 2015. |
| **Calculation of reliability** | Misztal I. and G. R. Wiggans, (1988) J.Dairy Sci, 71: (Supp. 2) 27-32.  Corrected in: Misztal, I. et al. (1991) J. Dairy Sci, 74: 2001-2009. |
| **Criteria for official publication of evaluations** | Reliability > 0.5 |
| **Number of evaluations / publications per year** | Two, May and November |
| **Use in total merit index4** | PD11 = 7.9\*(kg fat) +23.7\*(kg protein) – 300\*(SCS) + 26\*(% female fertility) + 0.6\*(days survival) + 10\*(% persistency) – 3\*(% dystocia) – 6\*(calf mortality) |
| **Anticipated changes in the near future** | None |
| **Key reference on methodology applied** | Weller, J. I. and Ezra, E. (2004) Genetic analysis of the Israeli Holstein dairy cattle population for production and non-production traits with a multitrait animal model. *J. Dairy Sci.* 87; 1519-1527. |
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1) Either: Production (e.g. milk, fat, protein), Conformation, Health (e.g. mastitis resistance, milk somatic cell, resistance to diseases other than mastitis), Longevity, Calving (e.g. stillbirth, calving ease), Female fertility (e.g. non-return rate, interval between reproductive events, number of AI’s, heat strength), Workability (e.g. milking speed, temperament), Beef production, Efficiency (e.g. body weight, energy balance, body conditioning score), or Other traits.

2) Indicate frequencies per category if the trait is categorical and specify transformation of data if practiced.

3) Use abbreviations for most common effects (see document with list of abbreviations at http://www-interbull.slu.se/service\_documentation/General/list\_of\_abbreviations.rtf) and indicate random (R) or fixed (F).

4) Please give economic weights and indicate how they are expressed (preferably in genetic standard deviation units).

**Form GE Appendix SM**

**Parameters for national genetic evaluations for udder health traits as provided to Interbull**

|  |  |
| --- | --- |
| **Country (or countries):** | Israel |
| **Main trait group:** | Health |
| **Breed(s):** | Holstein |

|  |  |  |  |
| --- | --- | --- | --- |
| Trait | h2a | genetic  variancea | official proof  standardisation formulab |
| Milk Somatic Cell: | 0.433 | 0.538 | No standardization is applied |
| Clinical Mastitis: |  |  |  |

a If repeated records are treated as separate traits, provide heritability estimates and genetic variances separately for each trait, as well as for all traits pooled, i.e. for the trait submitted to Interbull.

b Expressed as follows:  
StandEval=((eval-a)/b)\*c+d where a=mean of the base adjustment, b=standard deviation of the base, c=standard deviation of expression (include sign if scale is reversed), and d=base of expression.

**Heritabilities (on the diagonal) genetic correlations (above the diagonal) and environmental correlations (below the diagonal) for somatic cell score.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Parities** | | | | |  |
| 5 | 4 | 3 | 2 | 1 |  |
| 0.81 | 0.82 | 0.84 | 0.85 | 0.25 | 1 |
| 0.93 | 0.95 | 0.98 | 0.22 | 0.31 | 2 |
| 0.97 | 0.99 | 0.23 | 0.44 | 0.26 | 3 |
| 0.99 | 0.23 | 0.48 | 0.37 | 0.24 | 4 |
| 0.18 | 0.49 | 0.40 | 0.33 | 0.23 | 5 |

**Genetic variances for somatic cell score**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Parities | | | | |
|  | 1 | 2 | 3 | 4 | 5 |
| 1 | 0.243 | 0.197 | 0.209 | 0.229 | 0.235 |
| 2 | 0.197 | 0.223 | 0.234 | 0.254 | 0.260 |
| 3 | 0.209 | 0.234 | 0.256 | 0.284 | 0.289 |
| 4 | 0.229 | 0.254 | 0.284 | 0.322 | 0.331 |
| 5 | 0.235 | 0.260 | 0.289 | 0.331 | 0.349 |