Status as of: 2014-11-16

**DESCRIPTION OF NATIONAL GENETIC EVALUATION SYSTEM**

|  |  |  |
| --- | --- | --- |
| **Country (or countries)** | Israel | |
| **Main trait group1** | Production | |
| **Breed(s)** | Israeli Holstein | |
| **Trait definition(s) and unit(s) of measurement2** Attach an appendix if needed | 305 day milk, fat, and protein Kg production. Incomplete lactation records are extended to 305 days. |
| **Method of measuring and collecting data** | Milk recording by the Israel Cattle Breeders association. Milk production is either automatically recorded or recorded my milk inspectors. Samples are sent to the central lab monthly for fat and protein analysis by milk-o-scan. At herds with < 150 cows, samples are collected by milk inspectors. At smaller farms 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. Days dry must be < 150. Milk production must be between 2000 and 25,000 kg. Fat must be < 800 kg, and protein < 750 kg. Calving age must be between 640 and 2555 days. Cows change lactation number after drying off and calving. |
| **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 open, and multiplicative for calving age and month, and parity. All adjustments are to fourth-parity April calvings, for cows 60 months old, and 90 days open. Last update in August, 2012. Reference:  Ezra, E., Dror, D., Benchis B., Sturman, H., and Weller, J. I. (1996) Estimation of genetic parameters for production, calving, and conformation. *Meshek Habakar Vehahalav* **261**; 9 -12. (In Hebrew). |
| **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, 42,898 levels (F), parity by management group, discontinuous, 20 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 I |
| **Expression of genetic evaluations** If standardised (e.g. RBV), give standardisation formula on PART 2 | ETA, in Kgs, 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, June and December |
| **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 extension or 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/framesida-general.htm) and indicate random (R) or fixed (F).

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

**DESCRIPTION OF NATIONAL GENETIC EVALUATION SYSTEM**

|  |  |
| --- | --- |
| **Country (or countries)** | Israel |
| **Main trait group** | Production |
| **Breed (repeat as necessary)** | Israeli Holstein |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Trait | Definition | h2\* | genetic  variance\* | official proof  standardisation formula\*\* |
| Kg Milk | 305 day milk production | 0.428 | 751,710 kg2 | None |
| Kg Fat | 305 day fat production | 0.520 | 851 kg2 | None |
| Kg Protein | 305 day protein production | 0.414 | 474 kg2 | None |

\* If lactations are treated as separate traits, provide heritability estimates and genetic variances separately for each lactation, as well as for all lactations pooled, i.e. for the trait submitted to Interbull.

\*\* 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 milk production.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parities | | | | |  |
| 5 | 4 | 3 | 2 | 1 |  |
| 0.74 | 0.82 | 0.88 | 0.89 | **0.39** | 1 |
| 0.85 | 0.92 | 0.98 | **0.29** | 0.57 | 2 |
| 0.94 | 0.98 | **0.27** | 0.59 | 0.53 | 3 |
| 0.98 | **0.22** | 0.59 | 0.53 | 0.46 | 4 |
| **0.12** | 0.51 | 0.44 | 0.37 | 0.32 | 5 |

**Genetic variances for kg milk production**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Parities | | | |  |
|  | 1 | 2 | 3 | 4 | 5 |
| 1 | 520,987 | 415,214 | 412,572 | 372,837 | 290,826 |
| 2 | 415,214 | 413,630 | 409,378 | 373,435 | 295,805 |
| 3 | 412,572 | 409,378 | 424,791 | 401,483 | 330,350 |
| 4 | 372,837 | 373,435 | 401,483 | 393,914 | 332,472 |
| 5 | 290,826 | 295,805 | 330,350 | 332,473 | 293,383 |

**Heritabilities (on the diagonal) genetic correlations (above the diagonal) and environmental correlations (below the diagonal) for fat production.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parities | | | | |  |
| 5 | 4 | 3 | 2 | 1 |  |
| 0.76 | 0.84 | 0.88 | 0.91 | **0.42** | 1 |
| 0.90 | 0.96 | 0.99 | **0.38** | 0.58 | 2 |
| 0.95 | 0.99 | **0.34** | 0.61 | 0.53 | 3 |
| 0.98 | **0.29** | 0.59 | 0.55 | 0.46 | 4 |
| **0.20** | 0.52 | 0.47 | 0.41 | 0.34 | 5 |

**Genetic variances for kg fat production**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Parities | | | | |
|  | 1 | 2 | 3 | 4 | 5 |
| 1 | 599 | 592 | 580 | 549 | 442 |
| 2 | 592 | 707 | 709 | 680 | 569 |
| 3 | 580 | 709 | 727 | 710 | 604 |
| 4 | 549 | 680 | 710 | 711 | 619 |
| 5 | 442 | 569 | 604 | 619 | 560 |

**Heritabilities (on the diagonal) genetic correlations (above the diagonal) and environmental correlations (below the diagonal) for protein production.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Parities | | | | |  |
| 5 | 4 | 3 | 2 | 1 |  |
| 0.67 | 0.77 | 0.85 | 0.89 | **0.34** | 1 |
| 0.83 | 0.92 | 0.98 | **0.29** | 0.54 | 2 |
| 0.91 | 0.98 | **0.27** | 0.59 | 0.48 | 3 |
| 0.97 | **0.23** | 0.59 | 0.52 | 0.41 | 4 |
| **0.15** | 0.52 | 0.43 | 0.43 | 0.28 | 5 |

**Genetic variances for kg protein production**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Parities | | | | |
|  | 1 | 2 | 3 | 4 | 5 |
| 1 | 295 | 259 | 251 | 228 | 184 |
| 2 | 259 | 287 | 286 | 269 | 225 |
| 3 | 251 | 286 | 297 | 290 | 252 |
| 4 | 228 | 269 | 290 | 297 | 266 |
| 5 | 184 | 225 | 252 | 266 | 254 |