

Description of Model for Estimation of Breeding Values for Conformation

Evaluation is executed individually for breed HOL. Only conformation traits records of cows on first lactation are used for evaluation of bulls.

Data included into evaluation

Holstein population

- Data since 1.1.1995 onwards are used.
- Included bulls must be registered in HOL herdbook.
- Daughters of bulls must have at least 50% of HOL blood proportion and daughters with calving since October 1st 2002 must have at least 75% of HOL blood proportion.
- Age of daughters at first calving must be in interval <640; 1004> days.
- Classification of conformation must be performed in interval <30; 210> days after first calving (<30; 300> days for classification until 31.12.2008).

Transformation of conformation scores

Conformation scores are transformed according to the given table (below) because of better approaching to normal distribution and exclusion of extreme values. Value 74 and higher ones are not transformed.

50	65
51, 52, 53, 54, 55	66
56, 57, 58, 59, 60	67
61, 62	68
63, 64	69
65, 66	70
67, 68	71
69, 70	72
71, 72	73
73, 74	74

Model

ST- BLUP-AM

(Single Trait - BLUP - Animal Model)

Model equation

$$y_{ijk} = \text{HYC}_i + \text{CL}_j + \alpha_1 * \text{age} + \alpha_2 * \text{age}^2 + \beta_1 * \text{days} + \beta_2 * \text{days}^2 + a_k + e_{ijk}$$

y_{ijk}	value of recorded trait of cow k belonging to i-th HYC and j-th CL
HYC_i	fixed effect of i-th interaction of herd * year, month * classifier (min. number of cows within HYC = 2)
CL_j	fixed effect of j-th classifier

age	age of cow at calving
days	number of days between calving and classification
$\alpha_1, \alpha_2, \beta_1, \beta_2$	estimated regression coefficients
a_k	random effect of animal

Pedigree is traced back to the last known generation. If ancestor is unknown, genetic group is inserted instead. Genetic groups are defined according to country and year of birth of last registered animal in generation.

Final breeding value

Breeding values for bulls are expressed and published in form of relative breeding values. RBVs are standardized in parameters (100; 12) for bulls born in 2005.

Breeding values for cows are estimated but not published.