Description of total merit index for bulls and cows of Holstein breed

Index for bulls (SIH)

SIH is calculated for bulls:

- that have at least 75 % of Holstein or Red Holstein breed
- born since 1992
- with at least 6 herds for production traits and conformation

Rules for inclusion of RBV for somatic cells, fertility, conformation, longevity:

Female fertility

- if sum of effective number of inseminations for cows and heifers (SW_{cows} + $SW_{heifers}$) is at least 50, $RBV_{cows+heifers}$ is used; otherwise average RBV of population is used

Somatic cells

- average RBV of population for somatic cells is used if bull doesn't have RBV for somatic cells or number of herds is lower than 20

Conformation

- average RBV of population is used if bull doesn't have RBV for relevant trait or effective number of daughters is less than 15

Longevity

- average RBV of population is used if bull doesn't have RBV for longevity or number of culled daughters is less than 10

Traits included in SIH

RBV fat kg	RBVfatkg	RBV locomotion	RBVloc
RBV protein kg	RBVprotkg	RBV udder depth	RBVud
RBV fat %	RBVfat%	RBV fore udder attachment	RBVfua
RBV protein %	RBVprot%	RBV central ligament	RBVcl
RBV somatic cells	RBVsc	RBV front teat placement	RBVftp
RBV female fertility	RBVff	RBV rear udder height	RBVruh
RBV feet and legs	RBVfl	RBV teat length	RBVtl
RBV foot angle	RBVfa	RBV longevity	RBVlon
RBV rear leg rear view	RBVrlr		

SIH calculation:

SIH = 0,225 * RBVprotkg + 0,115 * RBVfatkg + 0,11 * RBVprot% +
+ 0,04 * RBVfat% + 0,12 * RBVff + 0,07 * RBVsc + 0,07 * RBVlon +
+ 0,0625 * RBVfl + 0,0375 * RBVfa + 0,0125 * RBVrlr + 0,0125 * RBVloc +
+ 0,0375 * RBVud + 0,025 * RBVfua + 0,025 * RBVcl + 0,0125 * RBVftp +
+ 0,01875 * RBVruh + 0,00625 * RBVtl

Milk production index

Imilk = 0,46 * RBVprotkg + 0,235 * RBVfatkg + 0,225 * RBVprot% +
+ 0,08 * RBVfat%

Feet and legs index

Ilegs = 0,5 * RBVfl + 0,3 * RBVfa + 0,1 * RBVrlr + 0,1 * RBVloc

Udder index

Iudder = 0,3 * RBVud + 0,2 * RBVfua + 0,2 * RBVcl + 0,1 * RBVftp +
+ 0,15 * RBVruh + 0,05 * RBVtl

Calculated SIH and the other indexes are standardized (100; 12).

Note

From equations above it is evident that partial indexes are not used in calculation of SIH but individual RBVs are used directly.

Used groups of traits

Production	Fertility	Udder health	Longevity	Conformation
49 %	12 %	7 %	7 %	25 %

Estimated genetic profit

Production	Fitness traits	Udder health	Beef
81,7 %	22,2 %	-0,7 %	-3,2 %

Requirements for bulls to be included into TOP SIH:

1. Breeding values for production traits, fertility and conformation calculated in the Czech Republic.
2. Production traits: at least 30 herds for 1st lactation.
3. Conformation: at least 20 herds (Feet and legs).
4. At least 50 inseminations by the semen of bull in the (current + last) year or bull was born in the last 8 years.

Index for cows (SIH-K)

SIH-K is calculated for cows:

- that have at least 75 % of Holstein or Red Holstein breed (however sire of Red Holstein cows has to have 100 % of Red Holstein breed or has to be registered in herd book)
- that have breeding values for production traits, somatic cells and conformation (feet and legs) calculated in the Czech Republic; breeding values for production traits and somatic cells are included just since 3 test day records are known

SIH-K calculation:

Same traits and weights as for SIH are used except female fertility and longevity that are not computed for cows. Calculated SIH-K and the other indexes are standardized (100; 12).

Requirements for cows to be included into TOP SIH-K:

1. Cow is not excluded from milk recording and is registered in herd book.
2. In the TOP list there are 1500 the best cows sorted according to SIH-K.