DESCRIPTION OF NATIONAL GENETIC EVALUATION SYSTEMS

Country (or countries)	Switzerland
Main trait group[1]	Production
Breed(s)	Brown Swiss
Trait definition(s) and unit(s) of measurement[2]	Milk, fat, and protein lactation yields (305-day) in kg
Method of measuring and collecting data	Until February 2004 all TD-records collected according to ICAR A4-method; now ~43% AT4
Time period for data inclusion	Cows which first calved since January 1, 1989. Pedigree is traced back 3 generations from that data
Age groups (e.g. parities) included	All parities
Other criteria (data edits) for inclusion of records	Includes all test day records between 5 and 365 days in milk (DIM). Test day records are expressed as 24-hour yields.
Criteria for extension of records	No extension of records is required.
Sire categories	All bulls
Environmental effects[3], pre-adjustments	Heterogeneous herd-test day variance adjustment, adjustment factors are estimated at every run. Pre-adjustment of phenotypic records for days pregnant
Method (model) of genetic evaluation[3]	MT (milk yield, fat yield, protein yield, somatic cell score) – ML (1, 2, 3+) - RR – TD -BLUP– AM. Later lactations (4 and up) are considered to be genetically the same as third lactation, permanent environmental effects in lactation 6 and later are assumed to be the same as 5th lactation.
Environmental effects[3] in the genetic evaluation model	Fixed: Herd-test day Regressions on DIM within Parity - Age of calving – Region – Time period - Season combination (6th order polynomials). Random: Animal lactation curve, lactation curve for permanent environment (4th order polynomials).
Adjustment for heterogeneous variance in evaluation model	Yes, see pre-adjustments
Use of genetic groups and relationships	Phantom parent groups are defined based on ancestry, birth year and selection pathway
Blending of foreign/Interbull information in evaluation	Blending of Interbull proofs (previous evaluation) of foreign proven bulls and converted proofs of foreign cows.
Genetic parameters in the evaluation	See appendix PR
System validation	Method 3
Expression of genetic evaluations If standardised (e.g. RBV), give standardisation formula in the appendix	EBV in kgs (305-day yield) within each lactation then averaged across lactations.
Definition of genetic reference base	Rolling base yearly updated in April, defined by cows born 6 to 8 calendar years ago, that have test day records included in the

Next base change	genetic evaluation: e.g. April 2015: cows born 2007 to 2009
Calculation of reliability	Similar to the procedure used to calculate EDC's
Criteria for official publication of evaluations	Daughters with at least 3 TD-records in at least 10 herds
Number of evaluations / publications per year	3
Use in total merit index[4]	MIW (production index) = 22.2 % milk kg, 60 % protein kg 17.8 % protein content GZW (TMI) = 45 % MIW, 5 % longevity, 13 % conformation, 12 % SCS, 5 % persistency of lactation, 20 % female fertility
Anticipated changes in the near future	none
Key reference on methodology applied	Schaeffer, L. R., J. Jamrozik, G. J. Kistemaker, and B. J. Van Doormaal. 1999. Experience with a test day model. J. Dairy Sci. (Abstract & to be submitted for publication) Jamrozik, J., L. R. Schaeffer, and F. Grignola. 1998. Genetic parameters for production traits and somatic cell score of Canadian Holsteins with multiple trait random regression model. 6WCGALP. 23:303-306. Jamrozik, J., L. R. Schaeffer, Z. Liu, and G. Jansen. 1997. Multiple trait random regression test day model for production traits. Interbull Bulletin No. 16:43.
Key organization: name, address, phone, fax, e-mail, web site	Evaluation Center: Qualitas AG Chamerstrasse 56, CH-6300 Zug, Switzerland Phone: +41 (0)41 768 92 92 Fax: +41 (0)41 768 92 99 e-mail: zws@qualitasag,ch web site: http://www.qualitasag.ch EBV's published by herdbook organisation: Swiss Brown Cattle Breeders' Federation Chamerstrasse 56, CH-6300 Zug, Switzerland web site: http://www.braunvieh.ch

1) Either: Production (e.g. milk, fat, protein), Conformation, Health (e.g. mastitis resistance, milk somatic cell, resistance to diseases other than mastitis), Longevity (e.g. direct longevity, combined 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).

Parameters for national genetic evaluations for production traits as provided to Interbull

Country (or countries):	Switzerland

Main trait group:	Production
Breed(s):	Brown Swiss

Trait	h^{2a}	genetic variance[a]	official proof standardisation formula[b]
Milk yield:	.37	318975	a = 0; c = 1; b = 1; d = 0
Fat yield:	.30	516	a = 0; c = 1; b = 1; d = 0
Protein yield:	.34	299	a = 0; c = 1; b = 1; d = 0

[a] If lactations, or part of 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.

[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.

Lactation heritabilities (diagonal), 305d PE correlations (above diagonal) and 305d genetic correlations (below diagonal) for Brown Swiss breed.

	M1	F1	P1	SCS1	M2	F2	P2	SCS2	M3	F3	P3	SCS3
M1	**.37**	.93	.96	-.24	.50	.49	.53	-.09	.42	.39	.44	-.07
F1	.79	**.31**	.93	-.23	.47	.53	.52	-.09	.40	.44	.44	-.07
P1	.88	.83	**.32**	-.20	.50	.50	.56	-.07	.42	.40	.46	-.05
SCS1	-.08	-.06	-.06	**.22**	-.11	-.12	-.11	.36	-.08	-.09	-.08	.28
M2	**.80**	.61	.71	-.07	**.38**	.95	.96	-.28	.51	.48	.52	-.12
F2	.58	.77	.65	-.05	.79	**.31**	.94	-.30	.48	.53	.51	-.14
P2	.67	.64	.80	-.07	.88	.85	**.35**	-.26	.53	.52	.58	-.11
SCS2	-.09	-.08	-.07	.74	-.23	-.22	-.21	**.27**	-.13	-.15	-.13	.50
M3	**.74**	.52	.64	-.05	**.91**	.68	.79	-.19	**.36**	.94	.97	-.29
F3	.54	.69	.59	-.05	.72	.89	.77	-.19	.79	**.28**	.94	-.31
P3	.56	.51	.69	-.05	.77	.73	.90	-.18	.87	.85	**.34**	-.26
SCS3	.03	.02	.03	.66	-.11	-.11	-.10	.82	-.13	-.15	-.14	**.25**

Heritability, Genetic and permanent environmental variances
(milk, fat, protein – 305d yield (kg^2), SCS – average daily score).
Combined values are submitted to Interbull

Effect	Trait	Lactation	Variance
Genetic	Milk	1	300'057
		2	379'223
		≥ 3	412'233
		Combined	318'975
	Fat	1	454
		2	650
		≥ 3	710
		Combined	516
	Protein	1	251
		2	373
		≥ 3	418
		Combined	299
	SCS	1	.377
		2	.410
		≥ 3	.448
		Combined	.340
Permanent Environment	Milk	1	346'657
		2	487'904
		≥ 3	435'001
	Fat	1	552
		2	816
		≥ 3	758
	Protein	1	369
		2	506
		≥ 3	466
	SCS	1	.785
		2	.696
		≥ 3	.515
Heritability	Milk	Combined	.37
	Fat	Combined	.30
	Protein	Combined	.34
	SCS	Combined	.25