

COUNTRY'S NAME	THE NETHERLANDS
Production traits	Milk, fat and protein
Breed	All breeds. These are evaluated by one joint animal model.
Trait definition and unit of measurement	Direct: 305-Day cumulative yield for milk, fat and protein (kg). Indirect: Fat and protein % are calculated from breeding values for milk, fat and protein yield by: $BVP_i = (100 * BVY_i - BVM * MUP_i) / (BVM + MUM)$ where: BVP _i = breeding values for percent fat, protein; BVY _i = breeding values for fat, protein yield; BVM = breeding value for milk yield; MUP _i = average adjusted % fat or protein of the base animals; MUM = average adjusted milk yield
	Data on milk fat and protein yield are collected from cows which are in milk recording. Only official milk recording records are considered, which are according the ICAR A-system with 3 - 6 weekly intervals (A3, A4, A5 and A6). The A3, A4, A5 and A6 system meet ICAR criteria for A system of milk recording (i.e. all milking animals in the herd and all milkings during a period of 24 hours). Samples are taken at every milking and are analysed for fat and protein percentage.
Criteria for inclusion & extension of records	Only herd-book registered animals are considered (>90% sire identified). The quality of official pedigree recording is controlled by a sample of offspring, for which the pedigree is verified by blood typing or by DNA fingerprint. Records of culled cows and naturally terminated lactations should have a minimum of 60 DIM. Records in progress should have a minimum of 180 DIM (records that were broken before day 180 are used when they could have had 180 days at the moment of the genetic evaluation and have at least a length of 60 days). Records shorter than 305 days are extended to 305-days (ISCC linear interpolation using standard curves).
Time period for data inclusion	Lactations since 1978, pedigree information is traced as far as possible.
Sire categories	All sires.
Number of lactations included in the evaluation	3
Environmental effects: Pre-adjustment	Age (in months; multiplicative adjustment), number of days open (additive adjustment) and heterosis / recombination (additive adjustment). Adjustment factors last updated 1995 for age and 1990 for days open.
Base for age pre-adjustment	24 months at calving.
Method (model) of genetic evaluation	ST – R – BLUP – AM
Environmental effects in the genetic evaluation model	Fixed- Herd * parity * year-season (every year season comprise 3 months), within herd heterogeneous variance, year * month of calving. Random: PE, additive genetic effect of the cow.
Use of genetic groups	Unknown parents are grouped together according to country of origin, selection path (6 paths), breed and birth year. All known relationships of cows and sires are considered. Selection paths are: unknown dam for cow, unknown dam for bull, unknown sire for cow, unknown sire for bull, both parents unknown for cow and both parents unknown for bull.
Genetic parameters in the evaluation	Yield traits: $h^2 = 0.35$, $t=0.55$ σ_g milk = 478 σ_g fat = 19,7 σ_g protein = 14,5
System validation	Extensive checks on input data and results. Further breeding values are estimated with ISO 9001 certified process. Interbull genetic trend validation test I, II and III.
Expression of genetic evaluations	BV (kg, %) at age of 24 months at calving.
Genetic (reference) base	2000 Holstein cow base (2000HC): All herdbook cows with at least 87.5% Holstein genes and a maximum of 12.5% Dutch Friesian genes, born in 1995 with official lactation records.
Next base change	2000 Red and White cow base (2000RC): All herdbook Red and White cows with at least 87.5% Holstein genes and a maximum of 12.5% MRY genes, born in 1995 with official lactation records

	<p>2000 MRY cow base (2000YC): All herdbook MRY (Meuse-Rhine-Yssel) cows with at least 87.5% MRY genes and a maximum of 12.5% Holstein genes, born in 1995 with official lactation records.</p> <p>BV's expressed on one base can be converted to another base with the base difference conversion factors shown in table 1.</p> <p>BV's, expressed on the 2000 Holstein cow, 2000 Red and White cow base and 2000 MRY cow base, are scaled with the average correction factors for heterogeneity of variances of the black and white cows born in 1995</p>
Criteria for official publication of evaluations	<p>Bulls : Reliability is at least 0.50 and at least 15 daughters in at least 5 herds. Cows : Reliability is at least 0.25</p>
Number of evaluations / publications per year	4 (February, August, May, November)
Use in production / total merit index	<p>Net profit index for milk (expressed in Dfl) Inet = -0.15 BV milk yield + 2 BV fat yield + 12 BV protein yield Durable Performance Sum (expressed in Dfl) DPS = Inet + 15(DU-100), where DU is BV durability</p>
Anticipated changes in the near future	
Key reference on methodology applied	Meuwissen, T.H.E., G. de Jong and B. Engel. 1995. Joint estimation of breeding values and heterogeneous variances of large data files. Journal of Dairy Science, of 79: 310-316.
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Appendix I

Base differences for production.

Trait	Base difference (1995HC- 1997RC)	Base difference (1995HC-1997YC)	Base difference (1997RC-1997YC)
kg milk	+450	+1225	+800
kg fat	+19	+55	+36
kg protein	+13	+33	+20
% fat	+0.00	+0.02	+0.02
% protein	-0.03	-0.18	-0.15
inet	+130	+322	+192

COUNTRY: The Netherlands											
Means (X), and standard deviations (SD) of breeding values (kg) from most recent run, by bulls' year of birth (BY) and breed.											
YB	NB	Milk		Fat		Protein		Fat %		Protein %	
		X	SD	X	SD	X	SD	X	SD	X	SD
Breed											
Black and White											
1981	506	-1212	662.19	-38	22.76	-41	18.00	0.25		0.01	
1982	505	-1075	649.01	-31	21.75	-37	17.22	0.26		-0.01	
1983	407	-931	641.55	-26	20.31	-33	16.77	0.23		-0.02	
1984	391	-939	619.69	-24	20.65	-31	15.63	0.27		0.02	
1985	387	-781	580.57	-21	18.92	-26	15.65	0.20		0.01	
1986	372	-567	633.32	-17	18.22	-20	16.01	0.12		-0.01	
1987	352	-364	577.45	-11	20.73	-15	15.40	0.07		-0.04	
1988	402	-180	560.89	-9	19.32	-10	15.12	-0.02		-0.06	
1989	432	-56	610.64	-5	20.46	-7	16.18	-0.04		-0.07	
1990	428	-26	535.51	-10	18.26	-6	14.57	-0.13		-0.07	
1991	420	63	533.93	-5	18.76	-2	14.46	-0.11		-0.06	
1992	421	231	520.19	-3	19.44	3	14.23	-0.18		-0.07	
1993	419	241	500.46	7	19.89	6	14.27	-0.05		-0.03	
1994	413	467	490.79	13	19.53	15	14.04	-0.10		-0.01	
1995	375	666	465.61	20	18.32	21	12.87	-0.11		-0.02	
1996	29	448	363.77	18	13.52	17	9.46	-0.02		0.02	
Breed											
Red and White											
1980	18	-724	613.11	-36	18.33	-30	18.69	-0.07		-0.08	
1981	23	-338	614.90	-26	20.31	-18	15.88	-0.18		-0.10	
1982	45	-747	787.84	-34	26.09	-30	20.01	-0.01		-0.07	
1983	60	-608	578.39	-29	19.79	-24	16.04	-0.03		-0.05	
1984	67	-554	672.72	-26	26.01	-22	15.89	-0.02		-0.05	
1985	96	-483	679.96	-22	25.99	-19	17.99	-0.01		-0.04	
1986	108	-508	689.39	-20	23.57	-18	17.08	0.05		0.00	
1987	81	-359	677.21	-18	26.15	-14	17.65	-0.03		-0.02	
1988	112	-283	678.51	-15	24.64	-12	18.17	-0.04		-0.03	
1989	145	-305	612.03	-17	24.68	-11	15.61	-0.06		-0.01	
1990	127	-136	613.77	-12	24.05	-7	15.52	-0.10		-0.04	
1991	125	-10	630.68	-8	23.60	-2	16.82	-0.12		-0.03	
1992	120	4	592.21	-7	22.07	-1	15.59	-0.11		-0.02	
1993	117	175	583.22	-1	21.12	4	13.90	-0.14		-0.03	
1994	147	357	535.03	6	20.78	11	14.07	-0.15		-0.02	
1995	103	441	583.60	18	16.59	17	13.92	-0.02		0.02	

COUNTRY: The Netherlands											
Averages (X) and standard deviations of breeding values (kg), by daughters' year of calving (YC), number of cows (NC) and breed.											
YC	NC	Milk		Fat		Protein		Fat %		Protein %	
		X	SD	X	SD	X	SD	X	SD	X	SD
Breed											
Black and White cows											
1980	217304	-1992	411.55	-73	16.40	-65	12.2	0.25			0.06
1981	239266	-1912	427.54	-69	17.29	-62	12.8	0.26			0.06
1982	258256	-1762	440.21	-63	17.58	-58	12.8	0.24			0.04
1983	272517	-1565	463.66	-54	18.13	-52	13.3	0.25			0.03
1984	252624	-1439	448.55	-48	17.44	-48	12.8	0.25			0.02
1985	233426	-1388	439.62	-44	17.04	-45	12.6	0.28			0.04
1986	226372	-1294	443.35	-39	16.66	-41	12.8	0.29			0.06
1987	214328	-1132	445.20	-33	16.42	-36	12.6	0.27			0.05
1988	226082	-961	427.47	-27	16.49	-31	12.3	0.24			0.03
1989	230790	-847	412.84	-22	16.11	-27	11.8	0.24			0.03
1990	225787	-734	419.87	-19	15.50	-24	11.8	0.20			0.02
1991	210865	-563	452.82	-15	17.11	-18	13.3	0.14			0.02
1992	211865	-418	444.27	-12	17.58	-14	13.2	0.09			0.00
1993	216126	-307	436.23	-9	16.94	-10	12.9	0.06			0.01
1994	209691	-167	428.99	-6	16.33	-6	12.7	0.02			0.00
1995	237930	-42	439.19	-1	16.40	-1	13.0	0.01			0.01
1996	229762	52	426.98	1	15.97	2	12.5	-0.02			0.00
1997	205095	137	417.52	6	15.42	6	11.9	0.00			0.02
1998	25543	173	395.01	8	14.68	7	11.2	0.01			0.02
Breed											
Red and White Holstein cows having a maximum of 25% MRII genes											
1980	2347	-1127	462.90	-55	17.94	-41	13.7	-0.09			-0.03
1981	3787	-1140	431.16	-53	17.20	-42	12.8	-0.04			-0.04
1982	10693	-1020	418.45	-50	17.28	-38	12.5	-0.09			-0.04
1983	17137	-971	415.84	-47	16.72	-36	12.3	-0.07			-0.04
1984	16818	-920	422.08	-44	17.06	-34	12.1	0.06			-0.03
1985	20349	-993	414.26	-41	17.71	-34	11.9	0.06			0.01
1986	32726	-933	440.45	-40	17.26	-32	11.8	0.03			0.01
1987	43918	-876	428.86	-39	17.37	-30	11.7	0.00			0.01
1988	45790	-851	436.43	-36	17.89	-28	11.8	0.04			0.03
1989	60655	-751	426.62	-35	17.21	-24	11.8	-0.03			0.04
1990	65819	-682	414.63	-32	17.12	-22	11.6	-0.03			0.03
1991	64246	-586	423.18	-27	18.80	-18	12.9	-0.02			0.04
1992	63632	-536	417.90	-25	18.30	-16	12.5	-0.02			0.05
1993	59941	-453	420.26	-24	17.51	-13	12.3	-0.07			0.05
1994	60698	-296	412.07	-13	19.93	-7	12.8	0.00			0.06
1995	64293	-215	406.26	-9	18.94	-4	12.2	0.01			0.06
1996	57873	-115	399.94	-5	17.98	-1	11.5	0.00			0.05
1997	478675	0	383.81	0	16.19	3	11.3	0.00			0.05
1998	314	59	407.41	3	15.83	6	12.0	0.01			0.06