

FACTS ON APPLIED SIRE-EVALUATION PROCEDURES FOR DAIRY PRODUCTION TRAITS

COUNTRY	FEDERAL REPUBLIC OF GERMANY
Breed(s)	Black and White, Simmental, Red and White, Braunvieh, Gelbvieh, Red Angler, Vorderwälder
Traits evaluated and units of measurement	Milk, fat and protein (kg), fat and protein %
Number of lactations	1-6 in Baden-Württemberg and Schleswig-Holstein 1-3 in all other states
Genetic parameters applied	$h^2=0.188-0.300$ for milk yield 0.175-0.305 for fat yield 0.194-0.281 for protein yield 0.30-0.50 for fat % 0.34-0.55 for protein %
Inclusion and extension of records	Age at calving 20-39 months. Records of culled cows and records in progress from day 46-249 are extended; records after day 250 are included as measured in 1st lactation yield; later lactations are not extended
Sire categories evaluated	All sires
Effects considered by preadjustments	Calving age and month (all states), calving interval (3 states)
by model of evaluation	In some cases regions; in some cases group of sires, cows (4 states)
Base for age adjustment	Population average (30 months)
Use of genetic groups/relationships/pedigree	Grouping of bulls by year of birth (all), genetic group (3 states), inclusion of sires' and dams' breeding value (some states)
Method of evaluation used	BLUP, single and multiple traits
Expression of genetic merit	RBV, standardized (S.D.=12) for index (fat + protein kg) BV (kg, %) for five individual traits
Genetic base, kind/definition	RBV: Rolling base, average of bulls tested in latest 3-year period BV: Fixed base, average of bulls born in 1975-77 From October 1987: Federal base within breed
Minimum requirements for official publication of sire proofs	20 daughters in 5 herds Smaller breeds: 10 daughters

Use of selection index
or total merit index

Relative breeding value (fat + protein, kg)

Name and address of organiza-
tion responsible for sire
evaluations and publishing of
results

Department for Agriculture of individual
states coordinated by
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Key references on methodology
applied

Year of birth of bulls	No. of bulls	Relative breeding values	Breeding values				Prot. kg				Fat %			
			Milk kg		Fat kg		Prot. kg		Fat %		S.D.		S.D.	
			$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.
Breed: German Black and White (Niedersachsen)														
1975	1997	87	-74	279	-1.9	14.1	-2.0	8.5	+0.019	0.18	+0.009	0.08		
76	4897	90	0	305	+0.4	15.0	+0.2	9.3	+0.001	0.18	+0.004	0.08		
77	2066	93	+69	313	+4.9	15.6	+2.9	9.7	+0.040	0.20	+0.011	0.09		
78	2040	95	+117	291	+6.1	14.9	+3.7	9.1	+0.026	0.19	-0.001	0.08		
79	2034	98	+174	280	+10.0	14.3	+5.6	8.8	+0.055	0.19	-0.002	0.08		
80	2018	101	+246	284	+14.0	14.2	+7.8	8.8	+0.076	0.19	-0.006	0.08		
81	1926	104	+313	271	+17.7	13.6	+9.3	8.3	+0.091	0.17	-0.019	0.07		
82	1507	106	+349	238	+21.0	12.2	+10.6	6.9	+0.124	0.14	-0.016	0.06		
Breed: Fleckvieh (German Simmental) (Bavaria and Baden-Württemberg)														
1975	792	92	-53	317	-2.4	13.0	-1.4	9.5	-0.008	0.174	+0.011	0.110		
76	804	93	-21	296	-1.2	12.1	-0.6	8.6	-0.007	0.167	+0.004	0.111		
77	787	96	+36	312	+1.9	12.8	+1.0	9.2	+0.012	0.174	-0.008	0.109		
78	779	98	+99	309	+5.0	13.2	+2.7	9.4	+0.030	0.184	-0.019	0.104		
79	754	100	+135	280	+6.3	11.1	+3.5	8.2	+0.027	0.173	-0.027	0.113		
80	732	102	+184	271	+8.3	11.3	+5.2	8.2	+0.027	0.167	-0.028	0.111		
81	668	105	+259	294	+12.7	12.1	+7.7	8.5	+0.046	0.183	-0.028	0.116		
82	514	105	+276	267	+12.3	10.8	+8.3	7.7	+0.033	0.164	-0.031	0.113		
Breed: Red and White (Rhineland)														
1975	205	93.2	-26	228	-3.2	9.9	-2.2	7.2	-0.05	0.193	-0.031	0.141		
76	228	96.6	+3	215	-0.1	10.5	+0.3	7.4	-0.03	0.200	+0.004	0.141		
77	231	99.6	+33	216	+3.4	10.8	+1.9	6.7	+0.047	0.227	+0.022	0.129		
78	215	97.8	-8	206	+1.8	10.1	+0.4	6.9	+0.047	0.199	+0.022	0.135		
79	213	101.4	+67	207	+5.8	11.1	+2.4	6.7	+0.076	0.235	+0.006	0.136		
80	204	102.3	+62	230	+7.7	11.3	+2.2	7.1	+0.134	0.226	+0.005	0.125		
81	134	104.2	+126	243	+9.8	12.0	+3.3	6.6	+0.144	0.249	-0.014	0.136		
82	42	107.3	+184	273	+14.1	13.6	+4.0	7.4	+0.206	0.209	-0.027	0.144		

Country: Federal Republic of Germany
 Number of tested bulls, (A.I. and N.S.) means and standard deviations of proofs by year

Year of birth of bulls	No. of bulls	Relative breeding values	Breeding values				Prot. kg				Fat %				Prot. %				
			Milk kg		Fat kg		Prot. kg		Fat %		Prot. %		Fat %		Prot. %				
			$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.			
Breed: Braunvieh (German Brown Cattle) (Baden-Württemberg and Bavaria)																			
1975	206	88	-90	277	11.6	-3.6	12.0	-2.5	9.0	-0.005	0.188	+0.015	0.123	-0.005	0.188	+0.015	0.123	-0.005	0.127
76	189	92	+2	319	12.8	+0.4	13.0	-0.2	10.2	+0.009	0.178	-0.008	0.114	+0.009	0.178	-0.008	0.114	+0.009	0.114
77	180	96	+91	310	11.6	+3.5	11.7	+2.9	9.5	+0.002	0.155	-0.005	0.106	+0.002	0.155	-0.005	0.106	+0.002	0.106
78	195	98	+162	274	10.6	+5.8	10.6	+4.1	8.4	-0.010	0.165	-0.035	0.104	-0.010	0.165	-0.035	0.104	-0.010	0.104
79	185	100	+205	267	10.9	+8.5	11.4	+5.8	8.8	+0.009	0.160	-0.031	0.115	+0.009	0.160	-0.031	0.115	+0.009	0.115
80	186	102	+248	279	11.4	+10.3	11.9	+7.6	8.9	+0.012	0.187	-0.024	0.109	+0.012	0.187	-0.024	0.109	+0.012	0.109
81	182	101	+242	270	10.7	+9.0	10.9	+6.0	8.6	-0.006	0.171	-0.057	0.104	-0.006	0.171	-0.057	0.104	-0.006	0.104
82	112	103	+278	254	9.5	+11.6	9.9	+7.9	7.4	+0.014	0.158	-0.050	0.104	+0.014	0.158	-0.050	0.104	+0.014	0.104
Breed: Gelbvieh (Bavaria)																			
1975	34	90	-126	297	11.4	-4.7	11.7	-2.8	9.0	+0.017	0.190	+0.043	0.176	+0.017	0.190	+0.043	0.176	+0.017	0.176
76	30	95	-24	276	13.0	+0.7	12.9	-0.7	10.2	+0.034	0.202	-0.005	0.122	+0.034	0.202	-0.005	0.122	+0.034	0.122
77	38	98	+122	271	10.7	+2.9	11.2	+2.5	8.1	-0.050	0.194	-0.042	0.150	-0.050	0.194	-0.042	0.150	-0.050	0.150
78	30	96	+94	312	11.9	+2.1	11.8	+0.9	9.3	-0.042	0.166	-0.058	0.125	-0.042	0.166	-0.058	0.125	-0.042	0.125
79	24	105	+250	306	11.2	+10.6	11.5	+7.6	8.5	+0.009	0.160	-0.036	0.106	+0.009	0.160	-0.036	0.106	+0.009	0.106
80	23	100	+115	346	13.8	+4.4	14.6	+5.3	10.0	-0.011	0.233	+0.026	0.120	-0.011	0.233	+0.026	0.120	-0.011	0.120
81	26	100	+94	219	8.9	+6.0	8.4	+3.9	7.7	+0.051	0.155	+0.007	0.100	+0.051	0.155	+0.007	0.100	+0.051	0.100
82	13	100	+23	198	8.8	+6.4	9.5	+2.5	7.2	+0.140	0.234	+0.032	0.142	+0.140	0.234	+0.032	0.142	+0.140	0.142
Breed: Red Angler (Schleswig-Holstein)																			
1975	62	99.5	-29	334	10.7	-3.9	12.4	-1.0	9.6	-0.049	0.258	+0.006	0.107	-0.049	0.258	+0.006	0.107	-0.049	0.107
76	73	103.2	+62	354	12.5	+0.8	14.7	+1.5	10.1	-0.039	0.189	-0.012	0.113	-0.039	0.189	-0.012	0.113	-0.039	0.113
77	57	104.6	-41	318	10.3	+3.6	12.4	-0.5	9.2	+0.128	0.249	+0.024	0.094	+0.128	0.249	+0.024	0.094	+0.128	0.094
78	68	105.0	+135	312	10.5	+2.7	11.2	+3.4	9.5	-0.080	0.209	-0.034	0.100	-0.080	0.209	-0.034	0.100	-0.080	0.100
79	64	99.4	-73	311	11.3	-1.0	12.8	-3.8	9.0	+0.062	0.233	-0.036	0.102	+0.062	0.233	-0.036	0.102	+0.062	0.102
80	74	100.0	-38	309	11.7	-3.3	13.7	-1.0	9.0	-0.022	0.223	0.000	0.089	-0.022	0.223	0.000	0.089	-0.022	0.089
81	92	100.6	-119	320	11.5	-0.7	12.9	-3.4	9.9	+0.119	0.215	+0.014	0.096	+0.119	0.215	+0.014	0.096	+0.119	0.096
82	95	105.6	+105	331	11.1	+6.1	12.8	+1.4	9.2	+0.029	0.217	-0.059	0.100	+0.029	0.217	-0.059	0.100	+0.029	0.100
83	63	98.8	-48	295	8.7	-1.0	11.3	-4.2	7.1	+0.037	0.170	-0.058	0.105	+0.037	0.170	-0.058	0.105	+0.037	0.105

Country: Federal Republic of Germany
 Number of tested bulls, (A.I. and N.S.) means and standard deviations of proofs by year

Year of birth of bulls	No. of bulls	Relative breeding values $\bar{x}$	S.D.	Breeding values				Prot. kg				Fat %				Prot. %			
				Milk kg		Fat kg		Prot. kg		Fat %		Prot. %							
				$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.				
Breed: Vorderwälder (Baden-Württemberg)																			
1975	66	96	8.6	-10	219	-1.0	9.6	0.0	7.3	-0.030	0.140	+0.010	0.080						
76	59	96	7.6	-15	203	-0.1	8.4	-0.2	6.7	+0.020	0.130	+0.010	0.070						
77	52	96	5.1	+2	151	+0.3	6.0	-0.5	4.4	+0.020	0.160	-0.020	0.090						
78	39	95	11.1	-10	290	+0.6	12.5	-2.6	9.2	+0.050	0.170	-0.050	0.080						
79	36	104	9.1	+342	276	+11.1	10.3	+4.9	7.8	-0.040	0.170	-0.160	0.120						
80	38	100	8.3	+166	221	+6.5	9.6	+0.8	6.5	+0.010	0.140	-0.120	0.100						
81	36	91	8.4	-114	231	-4.3	9.8	-6.3	7.2	+0.010	0.120	-0.070	0.120						
82	29	96	9.9	+103	220	+3.0	11.6	-3.0	7.7	-0.020	0.150	-0.160	0.080						

Country: Federal Republic of Germany

Average phenotypic levels of first lactation (305 days) production records included in the sire evaluation procedures

Year of production	Traits				
	Milk kg	Fat kg	Protein kg	Fat %	Protein %
Breed: German Black and White					
1980	4863	192	164	3.95	3.38
81	4966	194	163	3.91	3.28
82	4942	195	163	3.95	3.30
83	5089	201	168	3.94	3.29
84	5073	201	166	3.97	3.28
85	5086	204	167	4.01	3.29
86	5336	217	176	4.07	3.30
87	5528	228	181	4.13	3.27
Breed: Fleckvieh (German Simmental)					
1980	4012	157	138	3.92	3.42
81	4080	160	140	3.92	3.43
82	4114	161	138	3.91	3.36
83	4247	166	142	3.91	3.35
84	4297	168	144	3.92	3.35
85	4141	163	138	3.93	3.34
86	4261	168	144	3.94	3.38
87	4373	174	147	3.98	3.37
Breed: Red and White					
1980	4551	172	157	3.78	3.44
81	4656	172	155	3.68	3.33
82	4454	168	150	3.78	3.36
83	4578	175	153	3.83	3.35
84	4521	175	151	3.87	3.34
85	4531	177	153	3.90	3.37
86	4692	187	159	3.98	3.39
87	4880	197	164	4.04	3.37
Breed: Braunvieh (German Brown Cattle)					
1980	4205	163	144	3.89	3.40
81	4317	169	147	3.91	3.39
82	4406	172	148	3.91	3.36
83	4403	170	147	3.87	3.33
84	4476	174	150	3.89	3.36
85	4426	173	148	3.91	3.34
86	4540	179	153	3.94	3.37
87	4574	181	153	3.96	3.35

Country: Federal Republic of Germany

Average phenotypic levels of first lactation (305 days) production records included in the sire evaluation procedures

Year of production	Traits				
	Milk kg	Fat kg	Protein kg	Fat %	Protein %
Breed: Gelbvieh					
1980	3705	147	131	3.98	3.53
81	3759	149	131	3.97	3.50
82	3790	150	131	3.96	3.46
83	3908	154	135	3.94	3.46
84	3925	154	135	3.93	3.43
85	3693	146	127	3.95	3.44
86	3898	156	136	4.01	3.50
87	4030	162	140	4.02	3.47
Breed: Red Angler					
1980	4002	185	149	4.64	3.72
81	4158	190	153	4.57	3.69
82	4110	192	148	4.67	3.61
83	4194	197	149	4.70	3.55
84	4149	194	146	4.67	3.51
85	4178	198	148	4.75	3.54
86	4297	212	155	4.94	3.61
87	4422	220	159	4.97	3.59
Breed: Vorderwälder					
1980	3241	126	—	3.88	—
81	3254	125	—	3.84	—
82	3280	126	109	3.85	3.32
83	3365	131	111	3.89	3.31
84	3439	134	113	3.91	3.28
85	3530	139	116	3.92	3.39
86	3691	145	121	3.93	3.28
87	3709	146	121	3.93	3.27