

**FACTS ON SIRE EVALUATION PROCEDURES APPLIED FOR
PRODUCTION TRAITS**

COUNTRY: UNITED STATES OF AMERICA

Breed(s)	Ayrshire, Brown Swiss, Guernsey, Holstein, Red and White, Jersey, Milking Shorthorn
Trait(s) evaluated and unit(s) of measurement	Milk (lb), fat and protein (lb, %).
Number of lactations	First five (first lactation data required in order for any lactations to contribute to sire evaluation)
Genetic parameters assumed	$h^2 = 0.25$, $t=0.55$, $c=0.14$ For average situation., parameters vary depending on herd variance (e.g. h^2 ranges from 0.20 to 0.30)
Criteria for inclusion and extension of records	Lactations from culled cows included if ≥ 15 days, extended to 305 days. Records terminated with a dry date before 305 days are extended to 305 days. Records in progress included if ≥ 40 days. Extension based largely on last test.
Sire categories evaluated	All sires
Environmental effects considered by pre-adjustment	Age at calving, month, times milked per day, lactation length, heterogeneous variance
by evaluation model	Management group [flexible herd*year*season (2-12 months), parity, registry], herd by sire, PE
Base for age adjustment (months)	ME yield age (57-96 depending on breed and trait) across average of calendar months
Use of genetic groups and/or relationships	Unknown parents grouped by year and four paths of selection and, for Holsteins, separately for U.S. and Canadian animals/All relationship considered
Method of evaluation	ST BLUP repeatability AM
Expression of proof	PTA (lbs, %)
Genetic (reference) base	Stepwise, average PTA of cows born in 1985
Criteria for official publication of sire proofs	10 daughters with usable first lactation record
Number of evaluations/publications per year	2/2
Use of production index	Index for gross value (\$) of milk,fat and protein production based on prior year average prices. Used for percentiles and elite cow definition. $MFP\$ = 0.03664 * PTA \text{ milk} + 1.04 * PTA \text{ fat} + 1.28 * PTA \text{ protein}$

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Name, address and faxnumber of organization responsible for sire evaluation and publication

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Key references on methodology applied

-Wiggans, G.R., Misztal, I. and VanVleck, L.D. 1988. Implementation of an animal model for genetic evaluation of dairy cattle in the United States. J. Dairy Sci. 71(Suppl.2):54.
-Wiggans, G.R. and VanRaden, P.M. 1989. USDA-DHIA animal model genetic evaluations. Fact sheet H-2 in NCDHIP Handbook.
-VanRaden, P.M. and Wiggans, G.R. 1991 Derivation, calculation and use of national animal model information. J. Dairy Sci. 74:2737
-VanRaden, P.M., Wiggans, G.R. and Ernst, C.A. 1991. Expansion of projected lactation yield to stabilize genetic variance. J. Dairy Sci. 74:4344
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COUNTRY: UNITED STATES OF AMERICA

Number of AI bulls (NB) tested, means (X) and standard deviations (SD) of proofs (lb) from most recent run, by bull's year of birth (YB) and breed

		Milk		Fat		Protein		Fat %		Protein %	
YB	NB	X	SD	X	SD	X	SD	X	SD	X	SD
Breed:		Ayrshire									
1975	3	530	630	25.0	28.9	21.7	22.5	0.03	0.10	0.03	0.03
1976	5	134	582	-1.4	24.3	-0.8	14.9	-0.05	0.07	-0.04	0.04
1977	7	-174	303	-5.4	16.0	-7.3	11.5	0.01	0.09	-0.01	0.06
1978	7	-24	605	2.4	17.0	2.3	17.4	0.03	0.09	0.02	0.05
1979	14	104	334	6.0	11.0	4.9	9.5	0.02	0.09	0.01	0.06
1980	9	195	377	7.3	20.2	5.2	11.4	0.00	0.06	-0.01	0.03
1981	15	182	373	8.6	15.2	3.3	9.8	0.01	0.15	-0.02	0.09
1982	11	313	614	9.2	23.4	7.2	18.3	-0.02	0.07	-0.02	0.06
1983	25	384	505	13.4	19.5	11.4	14.7	-0.01	0.07	-0.01	0.06
1984	20	612	364	18.8	12.5	18.4	12.6	-0.03	0.06	-0.01	0.04
1985	16	516	281	22.9	11.9	16.7	10.9	0.02	0.08	0.00	0.04

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		Milk		Fat		Protein		Fat %		Protein %	
YB	NB	X	SD	X	SD	X	SD	X	SD	X	SD
Breed:		Brown Swiss									
1975	12	-426	590	-19.2	19.0	-14.3	20.0	-0.01	0.07	0.00	0.03
1976	12	57	726	9.8	32.5	7.0	25.7	0.05	0.10	0.03	0.04
1977	18	235	598	11.1	18.6	6.3	18.1	0.01	0.09	-0.01	0.05
1978	17	-190	738	-6.6	23.1	-4.6	20.4	0.01	0.13	0.02	0.06
1979	24	146	519	-0.6	21.2	2.5	16.0	-0.04	0.12	-0.01	0.06
1980	25	-18	436	-5.8	18.8	-2.3	16.0	-0.03	0.10	-0.01	0.06
1981	21	318	366	7.9	18.7	7.6	14.8	-0.03	0.09	-0.02	0.05
1982	20	314	520	11.4	25.5	7.9	18.9	-0.01	0.09	-0.02	0.06
1983	9	540	536	16.8	16.4	16.0	10.3	-0.02	0.12	-0.01	0.06
1984	15	524	437	26.7	15.6	22.5	13.2	0.04	0.09	0.03	0.06
1985	18	734	458	27.1	19.9	24.7	16.3	-0.01	0.07	-0.01	0.04
1986	13	699	453	34.3	16.2	25.0	14.5	0.04	0.07	0.01	0.04
Breed:		Guernsey									
1975	21	-418	538	-22.7	16.5	-16.2	16.0	-0.03	0.14	-0.01	0.06
1976	19	-246	424	-17.4	27.0	-12.8	16.0	-0.05	0.14	-0.04	0.06
1977	22	-152	517	-13.4	21.1	-6.7	17.2	-0.05	0.16	-0.01	0.06
1978	23	87	524	3.7	29.2	0.2	18.9	0.00	0.11	-0.02	0.05
1979	20	119	566	-1.8	15.5	1.0	13.4	-0.05	0.16	-0.02	0.08
1980	27	221	480	9.8	18.4	6.4	13.5	0.00	0.09	-0.01	0.06
1981	35	237	551	9.9	22.5	8.3	16.6	0.00	0.11	0.00	0.06
1982	44	285	458	14.5	20.1	9.9	14.5	0.01	0.11	0.00	0.06
1983	46	457	455	16.9	21.1	12.8	14.6	-0.03	0.13	-0.02	0.06
1984	44	480	479	21.5	21.0	16.4	15.3	0.00	0.12	0.00	0.05
1985	39	573	402	25.9	14.0	17.8	13.2	0.00	0.10	-0.01	0.05
1986	26	748	396	28.7	14.9	25.1	11.6	-0.04	0.08	-0.01	0.05
Breed:		Holstein									
1975	555	-524	595	-16.1	21.4	-13.9	16.6	0.02	0.10	0.01	0.05
1976	685	-392	606	-14.7	22.6	-12.0	16.7	0.00	0.10	0.00	0.05
1977	684	-180	616	-7.5	21.6	-5.0	17.1	0.00	0.11	0.00	0.06
1978	688	-182	599	-5.2	20.8	-4.4	16.5	0.01	0.10	0.01	0.05
1979	864	-15	639	-0.7	21.2	-0.1	17.7	0.00	0.11	0.00	0.05
1980	971	183	608	5.4	21.8	4.7	17.5	0.00	0.10	0.00	0.05
1981	961	378	608	12.2	21.2	9.9	17.1	0.00	0.10	-0.01	0.05
1982	993	568	621	16.8	21.2	14.1	17.8	-0.01	0.10	-0.02	0.05
1983	985	743	594	22.4	20.5	18.8	16.8	-0.02	0.10	-0.02	0.05
1984	962	940	638	29.0	20.7	22.5	16.8	-0.02	0.10	-0.03	0.05
1985	1058	1088	570	34.1	20.0	27.5	14.8	-0.02	0.10	-0.03	0.05

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Number of AI bulls (NB) tested, means (X) and standard deviations (SD) of proofs (lb) from most recent run, by bull's year of birth (YB) and breed											
		Milk		Fat		Protein		Fat %		Protein %	
YB	NB	X	SD	X	SD	X	SD	X	SD	X	SD
1986	1102	1160	508	41.5	18.4	33.8	14.1	0.00	0.09	-0.01	0.05
Breed:		Jersey									
1975	30	-264	497	-15.9	22.3	-9.4	16.1	-0.02	0.16	0.00	0.07
1976	22	-186	533	-12.0	20.0	-7.0	14.6	-0.02	0.16	0.00	0.09
1977	34	-46	463	-6.3	21.3	-0.2	15.6	-0.04	0.14	0.01	0.07
1978	26	37	587	-0.3	20.8	-0.1	16.5	-0.01	0.21	-0.01	0.09
1979	29	-31	503	-0.3	24.0	-1.8	18.4	0.00	0.15	0.00	0.07
1980	40	215	611	7.7	24.8	5.2	20.2	-0.02	0.14	-0.02	0.07
1981	58	134	486	3.7	19.7	0.9	14.7	-0.02	0.13	-0.03	0.07
1982	53	184	484	4.9	18.3	3.4	12.7	-0.03	0.13	-0.03	0.07
1983	61	502	543	20.3	23.3	15.0	16.4	-0.02	0.14	-0.03	0.07
1984	53	604	515	27.9	19.7	18.3	15.5	0.00	0.13	-0.03	0.06
1985	67	835	546	33.3	19.3	24.7	15.8	-0.04	0.14	-0.04	0.06
1986	86	883	433	43.4	17.2	27.5	13.6	0.01	0.11	-0.03	0.06

COUNTRY: UNITED STATES OF AMERICA					
Average of adjusted production records (lb) included in the most recent evaluation run, by daughters' year of birth (YB) and breed					
YB	Milk	Fat	Protein	Fat %	Protein %
Breed:	Ayrshire				
1980	12806	499	431	3.90	3.29
1981	12838	502	427	3.91	3.30
1982	13037	510	432	3.91	3.29
1983	13407	523	442	3.90	3.28
1984	13611	528	448	3.88	3.29
1985	13852	536	456	3.87	3.29
1986	14123	551	466	3.90	3.29
1987	14284	554	474	3.88	3.32
1988	14370	556	474	3.87	3.29
1989	14470	564	477	3.90	3.29
Breed:	Brown Swiss				
1980	14226	566	502	3.98	3.47
1981	14337	571	501	3.98	3.46
1982	14682	586	512	3.99	3.46
1983	14969	598	521	3.99	3.47
1984	15179	606	526	3.99	3.46
1985	15798	628	548	3.98	3.47

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Average of adjusted production records (lb) included in the most recent evaluation run, by daughters' year of birth (YB) and breed

YB	Milk	Fat	Protein	Fat %	Protein %
1986	15975	637	554	3.99	3.47
1987	16080	639	559	3.97	3.48
1988	16166	639	562	3.95	3.48
1989	16440	657	569	4.00	3.46
Breed:	Guernsey				
1980	11600	536	417	4.62	3.53
1981	11612	535	413	4.61	3.52
1982	11882	544	418	4.58	3.49
1983	12104	554	425	4.58	3.50
1984	12319	556	428	4.51	3.47
1985	12633	572	439	4.53	3.47
1986	12744	575	442	4.51	3.47
1987	12746	572	442	4.49	3.46
1988	13020	582	449	4.47	3.45
1989	13256	599	452	4.52	3.41
Breed:	Holstein				
1980	17355	624	551	3.60	3.14
1981	17382	628	548	3.61	3.13
1982	17723	640	553	3.61	3.12
1983	18157	652	565	3.59	3.12
1984	18529	665	574	3.59	3.11
1985	18986	682	587	3.59	3.10
1986	19389	700	599	3.61	3.10
1987	19655	708	610	3.60	3.11
1988	20018	722	620	3.61	3.11
1989	20181	733	615	3.63	3.06
Breed:	Jersey				
1980	11613	556	437	4.79	3.73
1981	11714	561	438	4.79	3.70
1982	11821	562	438	4.75	3.69
1983	12180	577	447	4.74	3.66
1984	12456	590	458	4.74	3.67
1985	12818	605	473	4.72	3.69
1986	13070	620	482	4.74	3.69
1987	13159	625	488	4.75	3.71
1988	13459	635	499	4.72	3.70
1989	13482	639	498	4.74	3.69
Breed:	Milking Shorthorn				
1980	11880	438	409	3.69	3.28

COUNTRY: UNITED STATES OF AMERICA**Average of adjusted production records (lb) included in the most recent evaluation run, by daughters' year of birth (YB) and breed**

YB	Milk	Fat	Protein	Fat %	Protein %
1981	12236	450	417	3.68	3.29
1982	12615	459	421	3.64	3.29
1983	13025	471	428	3.62	3.26
1984	13140	474	433	3.61	3.28
1985	13533	488	447	3.61	3.29
1986	14044	501	459	3.57	3.27
1987	14052	504	461	3.59	3.28
1988	14315	511	469	3.57	3.27
1989	14329	516	466	3.60	3.24