COUNTRY'S NAME	DENMARK
Production traits	**Milk, fat and protein**
Breed	Red Dane, Danish Holsteins, Danish Jerseys, Red and White
Trait definition and unit of measurement	Direct: 305 day lactation yield: Kg milk, kg fat, kg protein.
Criteria for inclusion & extension of records	Record with non-identified parents (≅10%) placed in separate phantom-parent groups according to birth year. Min. production level: 1500 kg milk, 65 kg fat and 60 kg protein. Max. production level: 22000 kg milk, 850 kg fat and 770 kg protein Every record of ≥ 45 days and ≥ 2 test-day records are extended by last test day method.
Time period for data inclusion	Cows with first records after 1981
Sire categories	
Number of lactations included in the evaluation	3. All lactations have same weights
Environmental effects: Pre-adjustment **Base for age pre-adjustment**	Heterosis for new breeds and heterogenous variance (last updated 1998)
Method (model) of genetic evaluation	ST – R – BLUP – AM
Environmental effects in the genetic evaluation model	Fixed: Management group – cluster, separate for heifers and others (max 1 year); Calving year x month x lact.; Calving age × lact. x period; Previous calving interval x lact x period; phantom parent groups. (Periods are 5 year intervals) Covariable: Current calving interval × lact.; heterosis. Random: Permanent environment; Animal
Use of genetic groups	Missing pedigree is grouped by year of calving of the cow. Missing pedigree in sires in the herdbook is group by internal breed × period (e.g. original Black and White and HF).
Genetic parameters in the evaluation	H^2=0.30, R=0.45
System validation	Data must be between min. and max. production level. Trend estimation is done according to Interbull Methods I & II.. Correlations and changes between different rounds are calculated for cows and bulls and big differences are investigated.
Expression of genetic evaluations	Domestic relative breeding value
Genetic (reference) base **Next base change**	Rolling base: cows who have completed or could have completed a 305 day lactation within the last year; AI bulls born 5-7 years before the publication date. International breeding value (in kgs) cows born in 1990. Rolling base: Each new evaluation; Fixed base: 2000
Criteria for official publication of evaluations	Bulls: 60 % reliability.
Number of evaluations / publications per year	8. January, March, April, June, July, September, October, December
Use in production / total merit index	S-index (see Appendix I)
Anticipated changes in the near future	None
Key reference on methodology applied	Animal Model for milk production (1999) (in Danish).Rapport nr. 86.Landsudvalget for Kvæg. Landbrugets Rådgivningscenter, Skejby, 71 pp.
Key organization: name, address, phone, fax, e-mail, web site	The Danish Agricultural Advisory Centre Udkaersvej15, Skejby DK-8200 Aarhus N, Denmark Phone: +45 87405000 Fax: +45 87405010 e-mail: lk@lr.dk www.lr.dk

Appendix I

Constitutes and weights used in the S-index

	Red Dane	Danish Holstein	Danish Jerseys	Red and white
Yield index	0.79	0.80	0.95	0.70
Beef production	0.15	0.05	0.00	0.25
Female fertility	0.24	0.25	0.16	0.15
Calving ability	0.17	0.18	0.06	0.20
Mastitis resistance	0.32	0.42	0.28	0.20
Body	0.00	0.20	0.00	0.15
Feet and legs	0.14	0.36	0.12	0.30
Mammary	0.36	0.40	0.42	0.50
Milking speed	0.22	0.14	0.15	0.15
Temperament	0.06	0.04	0.08	0.03

COUNTRY: Denmark

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

		Milk		Fat		Protein		Fat %		Protein %	
YB	NB	X	SD	X	SD	X	SD	X	SD	X	SD
Breed						Danish Holstein					
1978	207	77.7	6.3	80.4	6.5	80.4	5.4				
1979	204	80.3	7.1	83.0	6.6	83.0	5.8				
1980	186	82.2	6.1	84.2	6.1	83.7	5.1				
1981	220	82.6	6.0	86.5	6.7	84.9	5.2				
1982	258	83.2	5.9	88.1	6.3	85.2	5.3				
1983	233	84.8	6.0	88.7	7.1	86.2	5.4				
1984	292	86.8	6.4	90.0	6.1	87.7	5.5				
1985	287	88.6	6.7	92.0	6.0	90.0	5.4				
1986	322	90.1	6.3	93.1	6.5	91.7	5.4				
1987	313	91.2	6.2	94.2	6.3	92.9	5.1				
1988	355	94.1	6.1	96.3	6.1	94.5	4.8				
1989	311	95.4	5.9	97.9	5.3	96.1	4.7				
1990	296	95.9	6.2	98.7	5.9	96.4	4.8				
1991	397	97.8	5.8	97.3	5.4	98.4	4.7				
1992	366	99.2	6.3	98.4	5.6	99.4	4.8				
1993	337	100.3	6.2	100.1	6.1	100.2	4.8				
1994	313	101.4	6.0	101.8	5.7	101.2	4.7				
Breed						Danish Jerseys					
1978	64	79.5	5.8	86.7	4.9	82.7	4.3				
1979	63	79.1	6.0	87.3	5.8	82.5	5.1				
1980	66	81.9	6.3	91.4	6.3	85.4	5.5				
1981	62	80.9	6.6	91.7	6.3	85.2	5.8				
1982	68	80.2	6.2	90.4	5.2	84.3	5.4				
1983	95	81.4	6.2	91.0	5.5	85.3	5.1				
1984	88	82.5	5.8	91.9	4.93	86.0	5.0				
1985	85	82.7	5.8	92.6	4.6	87.1	5.0				
1986	88	86.3	6.6	93.1	5.0	89.0	4.7				
1987	71	89.0	7.0	92.1	5.4	90.5	5.2				
1988	90	89.6	6.5	96.1	6.0	92.5	5.3				
1989	92	91.0	6.4	98.3	4.8	94.4	4.5				
1990	69	91.8	5.8	98.1	5.2	94.8	4.6				
1991	90	93.2	6.4	98.7	5.8	95.1	5.7				
1992	91	98.5	8.3	98.5	6.8	98.4	6.6				
1993	84	100.3	7.6	100.0	5.5	100.2	6.0				
1994	81	101.0	8.0	102.9	4.7	101.7	4.6				
Breed						Red Dane					
1978	81	87.3	6.5	85.8	6.8	88.6	5.3				
1979	83	87.4	6.3	85.9	6.2	88.9	5.7				
1980	83	87.6	6.7	88.0	7.5	88.9	6.2				
1981	91	87.8	6.0	86.2	7.7	89.3	5.6				
1982	90	87.9	6.1	86.8	5.9	89.4	5.1				
1983	72	90.2	5.1	88.4	5.7	89.6	4.2				
1984	94	90.4	6.3	89.5	6.5	90.4	5.6				
1985	85	91.5	6.4	92.0	6.9	93.2	5.2				
1986	70	91.2	7.0	91.0	7.2	91.9	5.8				
1987	80	92.5	6.2	91.8	6.3	92.6	5.5				
1988	86	93.4	6.8	93.7	6.3	94.8	5.4				
1989	68	93.8	7.2	94.7	7.2	95.3	6.3				
1990	91	94.3	6.7	93.0	6.7	95.4	5.6				
1991	73	97.1	6.1	95.3	6.0	96.6	5.6				
1992	81	98.2	6.0	98.5	6.3	98.9	5.3				
1993	75	100.8	7.7	100.5	6.4	100.5	6.1				
1994	43	105.7	8.8	102.0	7.0	104.8	6.3				

Breed						Red and White			
1978	7	78.7	6.2	70.7	6.2	78.6	5.2		
1979	12	83.9	5.7	76.3	8.0	83.8	6.1		
1980	13	83.5	6.5	76.5	8.4	83.2	5.7		
1981	14	79.7	5.1	71.8	7.6	79.6	5.0		
1982	12	86.8	6.6	81.1	5.3	85.9	5.9		
1983	12	83.8	4.8	78.0	4.5	84.4	4.9		
1984	15	87.1	6.3	82.2	8.7	85.6	6.3		
1985	21	91.0	7.6	83.6	7.3	89.1	7.2		
1986	9	89.4	5.2	87.0	6.4	87.9	4.7		
1987	7	87.7	9.4	79.7	7.6	84.1	5.7		
1988	15	96.3	7.5	89.9	9.2	92.9	5.8		
1989	7	97.7	3.5	89.3	3.4	93.0	3.9		
1990	14	98.9	9.1	89.0	9.5	92.6	7.1		
1991	11	97.7	10.0	95.8	10.5	95.5	7.5		
1992	6	99.5	8.5	99.0	8.5	98.3	6.3		
1993	11	98.5	5.9	98.6	5.6	99.1	6.7		
1994	5	102.2	8.5	102.2	5.8	101.8	5.3		

COUNTRY: Denmark

Average of adjusted production records (kg) included in the most recent evaluation run, by daughters' year of calving (YC) and breed.

	Milk		Fat		Protein		Fat %		Protein %	
YC	X	SD	X	SD	X	SD	X	SD	X	SD
Breed					Danish Holstein					
1982	5271		212		177					
1983	5474		219		184					
1984	5756		232		190					
1985	6011		243		198					
1986	6209		253		204					
1987	6282		255		205					
1988	6384		259		209					
1989	6516		272		214					
1990	6509		275		215					
1991	6584		274		216					
1992	6734		281		221					
1993	6765		287		225					
1994	6851		290		228					
1995	7027		292		234					
1996	7121		297		240					
1997	7209		298		243					
1998	7272		302		245					
1999	7248		297		241					
Breed					Danish Jerseys					
1982	3764		232		154					
1983	3884		239		158					
1984	3997		248		160					
1985	4186		262		166					
1986	4280		270		169					
1987	4322		273		170					
1988	4376		275		175					
1989	4458		283		177					
1990	4464		286		179					
1991	4536		284		182					
1992	4601		287		185					
1993	4567		287		186					
1994	4665		291		190					
1995	4800		293		194					
1996	4863		298		199					
1997	4964		299		203					
1998	4988		301		204					
1999	4966		299		202					

Breed			Red Dane		
1982	5198	217	185		
1983	5292	218	188		
1984	5481	227	191		
1985	5722	237	199		
1986	5869	245	204		
1987	5901	246	204		
1988	6014	250	209		
1989	6152	263	214		
1990	6106	263	214		
1991	6138	260	214		
1992	6212	262	216		
1993	6204	266	218		
1994	6238	268	221		
1995	6378	271	226		
1996	6466	277	231		
1997	6522	77	233		
1998	6582	278	235		
1999	6633	275	234		
Breed			Red and White		
1982	4864	193	166		
1983	4971	196	176		
1984	5373	211	181		
1985	5373	211	181		
1986	5525	219	185		
1987	5509	218	184		
1988	5638	223	190		
1990	5704	235	193		
1991	5796	237	194		
1992	5997	244	200		
1993	6016	250	203		
1994	6060	254	206		
1995	6140	254	209		
1996	6207	260	213		
1997	6329	264	217		
1998	5988	6450	222		
1999	6437	269	219		