

**Singlestep malketid - Trine Andersen og Ulrik Sander Nielsen, december 2023**

Sammenlignes med de nuværende twostep GEBV avlsværdier og de nuværende traditionelle EBV avlsværdier.

**Resultater for HOL**

**Nordic HOL AI bulls with minimum 15 daughters with phenotype**

fødselsår	antal	mean		STD		difference		std	corr
		singlestep	traditionel	singlestep	traditionel	mean			
2000	373	92.9	94.7	10.3	10.4	-1.7		0.7	1.00
2001	426	92.9	94.6	10.8	10.9	-1.7		0.7	1.00
2002	394	93.8	95.4	10.6	10.6	-1.6		0.7	1.00
2003	352	94.2	95.6	11.3	11.4	-1.4		0.6	1.00
2004	359	96.2	97.4	11.9	12.0	-1.3		0.6	1.00
2005	351	95.9	97.0	12.1	12.2	-1.2		0.7	1.00
2006	388	97.5	98.6	11.9	11.9	-1.1		0.7	1.00
2007	301	96.7	97.7	11.9	11.9	-1.1		0.9	1.00
2008	251	95.9	96.6	10.8	10.9	-0.8		0.8	1.00
2009	224	96.8	97.8	11.7	11.0	-1.0		2.0	0.99
2010	193	95.1	96.6	11.4	10.2	-1.5		2.8	0.97
2011	155	96.9	97.5	11.7	11.2	-0.6		1.6	0.99
2012	170	96.2	97.0	10.7	10.2	-0.7		1.5	0.99
2013	147	99.5	99.9	10.6	10.0	-0.4		2.1	0.98
2014	112	98.7	98.6	12.0	11.7	0.1		1.7	0.99
2015	82	102.7	102.5	12.2	11.8	0.2		1.3	0.99
2016	65	100.5	100.4	10.4	9.9	0.2		1.1	1.00
2017	66	100.9	100.4	12.2	11.9	0.4		1.4	0.99
2018	72	102.9	101.8	12.4	12.1	1.1		2.5	0.98
2019	18	105.9	103.7	11.5	9.5	2.2		4.6	0.92

**Nordic HOL females without genotype, with phenotype**

fødselsår	antal	mean		STD		diff		std	corr
		singlestep	traditionel	singlestep	traditionel	mean			
2015	82067	97.4	98.2	8.7	8.6	-0.8		1.7	0.98
2016	103790	98.1	98.7	9.0	9.0	-0.6		1.7	0.98
2017	90600	98.7	99.1	8.9	8.8	-0.4		1.6	0.98
2018	81034	99.8	100.1	9.2	9.2	-0.3		1.6	0.99
2019	73490	99.6	99.7	8.7	8.7	-0.1		1.6	0.98
2020	66237	100.3	100.1	9.1	9.1	0.2		1.5	0.99
2021	15006	101.5	101.1	8.9	8.9	0.4		1.8	0.98

**Nordic HOL AI bulls with minimum 15 daughters with phenotype**

fødselsår	antal	mean		STD		diff		std	corr
		singlestep	twostep	singlestep	twostep	mean			
2000	275	92.7	95.3	10.8	12.1	-2.7		6.2	0.86
2001	260	93.5	96.5	10.8	12.1	-2.9		5.5	0.89
2002	297	94.3	96.4	10.5	11.9	-2.1		5.1	0.90
2003	258	93.6	94.7	10.9	12.0	-1.1		3.4	0.96
2004	323	96.4	97.8	12.0	12.9	-1.4		3.2	0.97
2005	340	95.9	97.0	12.1	13.1	-1.1		3.8	0.96
2006	380	97.6	99.0	11.9	13.2	-1.5		3.9	0.96
2007	300	96.7	97.9	11.9	13.1	-1.2		3.5	0.97
2008	249	95.8	96.8	10.9	11.9	-0.9		3.2	0.96
2009	223	96.9	98.2	11.7	12.6	-1.3		2.4	0.98
2010	193	95.1	95.5	11.4	11.9	-0.4		2.5	0.98
2011	154	96.9	97.8	11.7	12.4	-0.9		1.8	0.99
2012	170	96.2	96.6	10.7	11.2	-0.4		1.8	0.99
2013	147	99.5	99.9	10.6	11.2	-0.5		2.0	0.98
2014	112	98.7	98.9	12.0	12.3	-0.2		1.4	0.99
2015	82	102.7	102.9	12.2	12.5	-0.2		1.2	1.00
2016	65	100.5	100.2	10.4	10.6	0.3		1.0	1.00
2017	66	100.9	100.1	12.2	12.6	0.8		1.4	0.99
2018	72	102.9	102.3	12.4	12.2	0.6		2.1	0.98
2019	18	105.9	106.0	11.5	10.6	-0.1		2.5	0.98

**Nordic HOL AI bulls with no daughters with phenotype**

fødselsår	antal	mean		STD		diff		std	corr
		singlestep	twostep	singlestep	twostep	mean			
2019	51	104.7	102.5	11.2	10.7	2.2		3.1	0.96

2020	72	104.7	102.4	9.4	9.4	2.3	2.8	0.95
2021	58	104.6	102.7	8.1	8.1	1.9	2.8	0.94
2022	60	107.1	105.1	8.1	8.4	1.9	3.1	0.93
2023	16	105.9	103.7	6.6	6.3	2.2	3.9	0.81

#### Nordic HOL females with genotype, without phenotype

fødselsår	antal	mean		STD		diff		std	corr
		singlestep	twostep	singlestep	twostep	mean			
2019	24497	100.6	99.8	11.7	11.1	0.7	3.1	0.96	
2020	30915	101.1	100.0	11.9	11.2	1.1	3.1	0.96	
2021	50059	103.0	101.9	11.4	10.9	1.1	3.2	0.96	
2022	67659	103.5	102.3	10.9	10.5	1.2	3.4	0.95	
2023	34713	104.5	103.2	10.8	10.5	1.3	3.4	0.95	

#### Nordic HOL females with genotype, with phenotype

fødselsår	antal	mean		STD		diff		std	corr
		singlestep	twostep	singlestep	twostep	mean			
2015	6517	97.9	98.5	12.1	12.1	-0.5	3.2	0.97	
2016	11752	98.3	98.7	12.2	12.1	-0.3	3.1	0.97	
2017	17088	99.3	99.3	12.3	12.2	0.0	3.2	0.97	
2018	23368	101.1	100.6	12.2	12.1	0.4	3.2	0.96	
2019	24570	100.8	100.0	11.9	11.9	0.8	3.2	0.96	
2020	27951	101.7	100.6	12.1	12.1	1.1	3.2	0.96	
2021	12507	103.0	101.9	11.6	11.7	1.1	3.2	0.96	

#### Resultater for RDC

##### Nordic RDC AI bulls with minimum 15 daughters with phenotype

fødselsår	antal	mean		STD		difference		std	corr
		singlestep	traditionel	singlestep	traditionel	mean			
2000	266	86.7	89.0	11.5	11.6	-2.3	0.7	1.00	
2001	248	87.4	89.6	10.4	10.5	-2.2	0.7	1.00	
2002	215	88.9	90.9	10.5	10.5	-2.0	0.7	1.00	
2003	237	88.7	90.7	9.6	9.6	-2.0	0.7	1.00	
2004	226	89.5	91.4	10.5	10.6	-1.9	0.8	1.00	
2005	216	88.6	90.4	10.8	11.0	-1.8	0.8	1.00	
2006	218	90.6	92.2	10.0	10.1	-1.6	0.7	1.00	
2007	218	91.8	93.2	10.3	10.5	-1.4	0.8	1.00	
2008	199	94.3	95.7	9.5	9.5	-1.3	1.0	0.99	
2009	156	92.4	93.5	11.4	11.2	-1.1	1.8	0.99	
2010	157	96.6	97.6	11.6	11.0	-1.0	2.6	0.98	
2011	167	96.7	97.8	11.3	11.1	-1.0	2.1	0.98	
2012	164	98.1	98.7	11.2	10.6	-0.6	2.3	0.98	
2013	117	98.4	98.6	11.7	11.2	-0.2	2.4	0.98	
2014	84	98.1	98.4	12.0	11.5	-0.3	2.0	0.99	
2015	71	100.1	100.1	10.1	10.0	0.1	1.9	0.98	
2016	69	99.0	98.4	11.0	10.8	0.6	1.5	0.99	
2017	66	100.9	100.5	10.2	9.9	0.4	1.4	0.99	
2018	47	101.7	100.2	11.5	11.0	1.5	1.9	0.99	
2019	10	106.1	104.1	10.8	11.0	2.0	2.2	0.98	

##### Nordic RDC females without genotype, with phenotype

fødselsår	antal	mean		STD		diff		std	corr
		singlestep	traditionel	singlestep	traditionel	mean			
2015	29387	95.8	96.9	9.3	9.2	-1.0	1.6	0.98	
2016	26641	96.7	97.5	9.4	9.3	-0.8	1.6	0.99	
2017	23276	98.6	99.2	9.2	9.2	-0.6	1.6	0.99	
2018	19812	97.5	97.9	9.1	9	-0.4	1.6	0.98	
2019	17219	99.5	99.6	8.9	8.9	-0.1	1.5	0.99	
2020	15600	99.8	99.6	8.9	8.9	0.2	1.5	0.98	
2021	4046	101.1	100.5	8.8	8.8	0.7	1.7	0.98	

##### Nordic RDC AI bulls with minimum 15 daughters with phenotype

fødselsår	antal	mean		STD		diff		std	corr
		singlestep	twostep	singlestep	twostep	mean			
2000	238	87.1	89.6	11.4	11.7	-2.5	3.2	0.96	
2001	232	87.4	89.5	10.4	10.9	-2.1	3.5	0.95	
2002	195	89.3	91.0	10.3	10.9	-1.7	3.1	0.96	
2003	219	88.6	90.8	9.6	9.7	-2.2	3.3	0.94	
2004	224	89.6	91.0	10.5	11.2	-1.4	3.3	0.96	
2005	214	88.6	90.7	10.8	11.1	-2.0	3.0	0.96	
2006	218	90.6	92.2	10.0	10.7	-1.7	2.8	0.97	

2007	217	91.7	93.4	10.3	10.9	-1.7	3.1	0.96
2008	199	94.3	95.7	9.5	10.7	-1.4	2.9	0.97
2009	156	92.4	93.9	11.4	12.4	-1.5	2.0	0.99
2010	157	96.6	98.2	11.6	12.7	-1.6	2.4	0.98
2011	167	96.7	97.9	11.3	12.3	-1.2	2.0	0.99
2012	164	98.1	99.0	11.2	12.1	-0.9	2.5	0.98
2013	117	98.4	99.1	11.7	12.6	-0.7	2.1	0.99
2014	84	98.1	98.2	12.0	12.8	-0.1	1.8	0.99
2015	71	100.1	100.1	10.1	10.5	0.0	1.4	0.99
2016	68	98.9	98.6	11.0	11.3	0.3	1.3	0.99
2017	66	100.9	100.3	10.2	10.7	0.6	1.5	0.99
2018	47	101.7	101.0	11.5	11.4	0.7	1.9	0.99
2019	10	106.1	107.3	10.8	9.7	-1.2	3.0	0.96

#### Nordic RDC AI bulls with no daughters with phenotype

fødselsår	antal	mean		STD		diff		std	corr
		singlestep	twostep	singlestep	twostep	mean			
2019	67	105.6	105.3	9.2	9.2	0.4	3.2	0.94	
2020	74	103.7	102.4	8.7	9.2	1.2	3.4	0.93	
2021	72	105.8	105.0	10.0	10.1	0.7	3.5	0.94	
2022	73	107.5	106.4	7.7	8.4	1.2	3.6	0.90	
2023	26	107.5	105.0	7.9	7.7	2.5	3.1	0.92	

#### Nordic RDC females with genotype, without phenotype

fødselsår	antal	mean		STD		diff		std	corr
		singlestep	twostep	singlestep	twostep	mean			
2019	9797	100.8	99.9	9.7	10.2	0.9	3.2	0.95	
2020	10691	100.6	99.4	9.9	10.5	1.2	3.3	0.95	
2021	19503	102.4	101.5	9.6	10.1	0.9	3.4	0.94	
2022	24370	103.0	102.6	9.2	9.9	0.3	3.6	0.93	
2023	11481	103.7	102.9	9.0	9.8	0.9	3.6	0.93	

#### Nordic RDC females with genotype, with phenotype

fødselsår	antal	mean		STD		diff		std	corr
		singlestep	twostep	singlestep	twostep	mean			
2015	6327	96.5	97.1	10.9	11.5	-0.7	3.2	0.96	
2016	9165	97.3	97.7	10.8	11.4	-0.3	3.3	0.96	
2017	10293	99.5	99.4	10.7	11.4	0.1	3.4	0.95	
2018	11521	98.4	98.1	10.4	11.0	0.3	3.5	0.95	
2019	11558	101.3	100.6	10.2	10.8	0.8	3.5	0.95	
2020	12990	101.1	100.0	10.1	10.9	1.2	3.6	0.94	
2021	4415	102.9	101.7	9.9	10.7	1.2	3.6	0.94	

#### Resultater for JER

##### Nordic JER AI bulls with minimum 15 daughters with phenotype

fødselsår	antal	mean		STD		difference		std	corr
		singlestep	traditionel	singlestep	traditionel	mean			
2000	72	93.6	96.0	9.3	9.1	-2.4	1.0	0.99	
2001	50	91.4	93.8	10.0	9.9	-2.4	1.0	1.00	
2002	55	97.7	99.5	9.8	9.7	-1.8	1.2	0.99	
2003	54	98.1	100.0	9.9	9.7	-1.9	0.9	1.00	
2004	48	95.4	97.3	13.7	13.7	-1.9	0.7	1.00	
2005	44	96.7	98.5	10.4	10.1	-1.8	0.8	1.00	
2006	49	95.5	97.1	9.4	9.4	-1.6	0.8	1.00	
2007	55	97.7	99.3	8.1	7.8	-1.6	0.9	0.99	
2008	45	100.5	102.0	9.7	9.4	-1.5	1.1	0.99	
2009	50	100.6	101.6	11.3	10.5	-1.1	2.3	0.98	
2010	54	93.6	94.6	10.7	9.9	-1.0	3.0	0.96	
2011	47	95.1	96.7	12.6	12.1	-1.6	2.3	0.98	
2012	43	97.4	98.3	10.2	9.2	-0.9	2.3	0.98	
2013	46	101.3	102.3	8.7	7.3	-1.0	3.3	0.93	
2014	36	98.9	99.4	10.8	10.7	-0.5	1.8	0.99	
2015	30	103.4	103.4	11.7	10.8	-0.1	1.4	1.00	
2016	25	98.0	97.6	8.4	7.8	0.4	2.0	0.97	
2017	29	102.7	101.9	10.8	10.5	0.8	1.4	0.99	
2018	19	98.1	97.8	10.5	9.6	0.3	2.3	0.98	
2019	17	103.0	101.7	9.8	8.5	1.3	2.2	0.98	

##### Nordic JER females without genotype, with phenotype

fødselsår	antal	mean		STD		diff		std	corr
		singlestep	traditionel	singlestep	traditionel	mean			

2015	5563	98.6	99.8	9.0	8.8	-1.2	1.9	0.98
2016	8903	99.5	100.5	9.4	9.3	-1.0	1.7	0.98
2017	8148	100.0	100.7	9.5	9.4	-0.7	1.6	0.99
2018	7914	99.4	99.8	8.9	8.8	-0.4	1.5	0.99
2019	6513	99.9	100.0	9.2	9.2	-0.1	1.4	0.99
2020	6721	99.8	99.7	8.9	8.9	0.2	1.3	0.99
2021	3139	99.0	98.9	7.9	7.9	0.1	1.3	0.99

**Nordic JER AI bulls with minimum 15 daughters with phenotype**

fødselsår	antal	mean		STD		diff		std	corr
		singlestep	twostep	singlestep	twostep	mean			
2000	70	93.6	96.8	9.4	10.4	-3.2	6.1	0.81	
2001	49	91.3	96.1	10.1	11.4	-4.8	5.8	0.86	
2002	53	97.5	101.8	9.9	11.2	-4.3	5.4	0.87	
2003	53	98.1	100.5	9.9	11.0	-2.4	3.3	0.95	
2004	48	95.4	98.1	13.7	14.4	-2.7	2.6	0.98	
2005	44	96.7	99.0	10.4	10.6	-2.2	1.9	0.98	
2006	48	95.3	96.8	9.4	10.3	-1.5	2.5	0.97	
2007	55	97.7	99.6	8.1	8.8	-1.9	2.1	0.97	
2008	44	100.6	101.9	9.8	10.9	-1.3	2.1	0.98	
2009	50	100.6	102.8	11.3	12.1	-2.2	2.2	0.98	
2010	54	93.6	95.2	10.7	11.6	-1.5	2.6	0.97	
2011	47	95.1	96.3	12.6	13.7	-1.2	2.4	0.99	
2012	43	97.4	98.0	10.2	10.8	-0.6	1.9	0.99	
2013	46	101.3	102.3	8.7	10.2	-1.0	2.7	0.97	
2014	36	98.9	99.8	10.8	11.4	-0.9	1.5	0.99	
2015	30	103.4	103.5	11.7	12.5	-0.1	1.4	1.00	
2016	24	97.7	97.2	8.4	9.2	0.4	1.3	0.99	
2017	28	103.0	102.7	10.9	10.9	0.3	1.2	0.99	
2018	19	98.1	97.4	10.5	10.9	0.7	1.5	0.99	
2019	17	103.0	103.0	9.8	9.8	0.0	1.9	0.98	

**Nordic JER AI bulls with no daughters with phenotype**

fødselsår	antal	mean		STD		diff		std	corr
		singlestep	twostep	singlestep	twostep	mean			
2019	33	101.2	100.8	11.1	11.1	0.3	2.4	0.98	
2020	32	103.8	103.3	9.5	8.8	0.4	2.6	0.96	
2021	40	100.4	99.9	9.6	10.0	0.5	2.7	0.96	
2022	34	100.5	101.1	9.1	8.6	-0.6	2.4	0.97	
2023									

**Nordic JER females with genotype, without phenotype**

fødselsår	antal	mean		STD		diff		std	corr
		singlestep	twostep	singlestep	twostep	mean			
2019	9046	100.3	100.6	10.4	10.2	-0.3	2.6	0.97	
2020	11017	100.3	100.5	10.3	10.2	-0.1	2.5	0.97	
2021	12755	99.1	99.4	9.7	9.9	-0.3	2.4	0.97	
2022	15798	100.8	100.6	10.1	10.2	0.2	2.6	0.97	
2023	7756	101.2	101.3	9.6	9.8	-0.1	2.5	0.97	

**Nordic JER females with genotype, with phenotype**

fødselsår	antal	mean		STD		diff		std	corr
		singlestep	twostep	singlestep	twostep	mean			
2015	1382	99.2	100.4	11.3	11.6	-1.1	2.7	0.97	
2016	2348	100.6	101.5	11.7	12.0	-0.9	2.8	0.97	
2017	2895	100.5	101.1	11.5	11.9	-0.6	3.0	0.97	
2018	3682	99.7	100.0	10.6	11.2	-0.2	3.0	0.96	
2019	4096	100.3	100.5	10.8	11.5	-0.1	3.1	0.96	
2020	4861	100.3	100.3	11.0	11.7	0.1	3.1	0.97	
2021	2567	98.8	98.9	10.1	11.0	-0.1	2.9	0.96	