STØTTET AF
Mælkeafgiftsfonden

Snell score calving sire and parent

I have run a full model and a reduced model (same as used for interbull validation test3).
I have counted how many offspring each bull have in full and reduced.

Regression of bull index full and parent index reduced
Bulls. AI. Nordic. Bull has >250 offspring in full model and zero offspring in reduced model.
Father has >250 offspring in reduced and MGS has >250 offspring in reduced.
Model1: own_index_full = mother_index_reduc + father_index_reduc
Model2: own_index_full = mgs_index_reduc + father_index_reduc

HOL current

trait	model1 N	model1 b1mother	model1 b1father	model1 Rsq	Model2 N	model2 b1mgs	model2 b1father	model2 Rsq
dSB1	42	0.02	0.43	0.23	45	0.10	0.44	0.25
dCE1	42	0.32	0.17	0.13	45	0.26	0.25	0.18
dCS1	28	0.55	-0.16	0.26	31	0.34	0.14	0.16
dSB2	79	0.03	0.39	0.14	84	0.10	0.39	0.17
dCE2	78	0.20	0.02	0.04	81	0.22	0.17	0.06
dCS2	60	0.32	0.47	0.21	63	0.25	0.54	0.25

HOL snell score

trait	model1 N	model1 b1mother	model1 b1father	model1 Rsq	Model2 N	model2 b1mgs	model2 b1father	model2 Rsq
dSB1	42	0.08	0.48	0.25	45	0.11	0.48	0.27
dCE1	42	0.26	0.11	0.09	45	0.24	0.20	0.15
dCS1	28	0.54	-0.18	0.20	31	0.35	0.11	0.15
dSB2	79	-0.01	0.38	0.16	84	0.14	0.39	0.19
dCE2	78	0.18	-0.12	0.04	81	0.23	0.05	0.06
dCS2	61	0.30	0.46	0.18	64	0.25	0.52	0.24

RDC snell score

trait	model1 N	model1 b1mother	model1 b1father	model1 Rsq	Model2 N	model2 b1mgs	model2 b1father	model2 Rsq
dSB1	40	0.16	0.13	0.03	40	0.21	0.12	0.07
dCE1	37	0.12	0.31	0.13	37	0.21	0.36	0.21
dCS1	4	-0.92	-0.03	0.98	4	-0.26	-0.44	0.92
dSB2	67	0.45	0.26	0.11	67	0.22	0.24	0.09
dCE2	56	0.25	0.34	0.12	56	0.14	0.37	0.12
dCS2	10	-0.08	0.17	0.02	10	0.06	0.22	0.02

JER snell score

trait	model1 N	model1 b1mother	model1 b1father	model1 Rsq	Model2 N	model2 b1mgs	model2 b1father	model2 Rsq
dSB1	20	0.32	0.66	0.18	20	0.13	0.65	0.16
dCE1	20	0.22	0.27	0.11	20	0.09	0.27	0.10
dCS1	18	0.19	0.58	0.41	18	0.28	0.60	0.50
dSB2	32	0.50	0.41	0.14	32	0.23	0.41	0.11
dCE2	30	-0.22	0.28	0.04	30	-0.14	0.26	0.04
dCS2	30	0.30	0.60	0.46	30	0.28	0.60	0.52

For phenotypic means the limitations are less strict than the index regressions

Therefor it is based on more bulls. RAW data and EDIT data are studied.

The limits are:

- Breed of the calf (HOL, RDC or JER)
- Birth year of the calf (>2015)
- Birth country of the calf (DNK, FIN or SWE)
- Nav_sid of the calf must have status1
- Minimum number of offspring behind the mean

Test of heritabilities for calving traits

Offspring of the bull is split randomly in two groups. The minimum number of offspring in each of the two groups are shown in the table (300, 350 or 500). Based on the expected heritability (these are from Jørn) and the minimum number of offspring, the reliability of the bulls' progeny mean is calculated (r). The mean of the first group is correlated with the mean of the second group for the bulls (c). The number of bulls in the correlation (N). The expectation is that (r) and (c) is at similar level if the heritability is correct.

Current HOL, RAW, BYR >2015

		DNK			FIN			SWE		
trait	h2	r500	c500	N500	r350	c350	N350	r500	c500	N500
SB1	0.049	0.86	0.80	206	0.81	0.76	47	0.86	0.67	29
CE1	0.101	0.93	0.94	196	0.90	0.90	23	0.93	0.83	29
CS1	0.247	0.97	0.91	195	.	.	.	.	.	.
SB2	0.012	0.60	0.36	282	0.51	0.30	121	0.60	0.22	78
CE2	0.061	0.89	0.83	264	0.84	0.82	61	0.89	0.44	76
CS2	0.222	0.97	0.94	259	.	.	.	.	.	.

Current HOL, RAW, BYR >2015, more bulls

		DNK			FIN			SWE		
trait	h2	r150	c150	N150	r150	c150	N150	r150	c150	N150
SB1	0.049	0.65	0.70	309	0.65	0.58	152	0.65	0.62	143
CE1	0.101	0.80	0.90	296	0.80	0.83	105	0.80	0.71	141
CS1	0.247	0.91	0.88	295	.	.	.	.	.	.
SB2	0.012	0.31	0.22	536	0.31	0.10	234	0.31	0.23	245
CE2	0.061	0.70	0.71	498	0.70	0.76	167	0.70	0.29	239
CS2	0.222	0.90	0.80	492	.	.	.	.	.	.

Current HOL, RAW, BYR 1995-2000

		DNK			FIN			SWE		
trait	h2	r500	c500	N500	r300	c300	N300	r350	c350	N350
SB1	0.049	0.86	0.88	54	0.79	0.72	24	0.81	0.75	31
CE1	0.101	0.93	0.93	46				0.90	0.84	29
CS1	0.247	0.97	0.98	45				.	.	.
SB2	0.012	0.60	0.78	64	0.47	0.33	42	0.51	0.66	45
CE2	0.061	0.89	0.94	55				0.84	0.53	42
CS2	0.222	0.97	0.99	52				.	.	.

Current HOL, RAW, BYR 1995-2000, more bulls

		DNK			FIN			SWE		
trait	h2	r150	c150	N150	r150	c150	N150	r150	c150	N150
SB1	0.049	0.65	0.61	85	0.65	0.31	50	0.65	0.62	41
CE1	0.101	0.80	0.88	79				0.80	0.72	41
CS1	0.247	0.91	0.95	79				.	.	.
SB2	0.012	0.31	0.28	141	0.31	0.30	114	0.31	0.22	109
CE2	0.061	0.70	0.80	113				0.70	0.40	78
CS2	0.222	0.90	0.91	112				.	.	.

Current RDC, RAW, BYR >2015

		DNK			FIN			SWE		
trait	h2	r300	c300	N300	r300	c300	N300	r350	c350	N350
SB1	0.042	0.76	0.41	32	0.76	0.39	77	0.79	0.31	39
CE1	0.074	0.85	0.78	30	0.85	0.92	43	0.87	0.81	38
CS1	0.284	0.96	0.89	30	.	.	.	.	.	.
SB2	0.012	0.47	0.30	55	0.47	0.38	142	0.51	0.15	78
CE2	0.024	0.64	0.62	44	0.64	0.84	93	0.68	0.64	77
CS2	0.261	0.95	0.91	44	.	.	.	.	.	.

Current RDC, RAW, BYR >2015, more bulls

		DNK			FIN			SWE		
trait	h2	r100	c100	N100	r100	c100	N100	r100	c100	N100
SB1	0.042	0.51	0.40	98	0.51	0.44	198	0.51	0.27	136
CE1	0.074	0.65	0.78	97	0.65	0.84	154	0.65	0.61	134
CS1	0.284	0.88	0.84	95	.	.	.	.	.	.
SB2	0.012	0.23	0.10	134	0.23	0.33	304	0.23	0.18	209
CE2	0.024	0.38	0.54	124	0.38	0.74	213	0.38	0.43	209
CS2	0.261	0.87	0.84	126	.	.	.	.	.	.

Current RDC, RAW, BYR 1995-2000

		DNK			FIN			SWE		
trait	h2	r250	c250	N250	r350	c350	N350	r350	c350	N350
SB1	0.042	0.73	0.91	25	0.79	0.74	72	0.79	0.82	31
CE1	0.074	0.82	0.97	23				0.87	0.89	30
CS1	0.284	0.95	0.99	23				.	.	.
SB2	0.012	0.43	0.83	32	0.51	0.76	133	0.51	0.74	40
CE2	0.024	0.60	0.81	29				0.68	0.86	39
CS2	0.261	0.95	0.97	30				.	.	.

Current RDC, RAW, BYR 1995-2000, more bulls

		DNK			FIN			SWE		
trait	h2	r100	c100	N100	r100	c100	N100	r100	c100	N100
SB1	0.042	0.51	0.75	40	0.51	0.53	687	0.51	0.21	274
CE1	0.074	0.65	0.93	40				0.65	0.42	202
CS1	0.284	0.88	0.91	39				.	.	.
SB2	0.012	0.23	0.39	95	0.23	0.44	771	0.23	0.27	548
CE2	0.024	0.38	0.60	55				0.38	0.32	452
CS2	0.261	0.87	0.88	54				.	.	.

Current JER, RAW, BYR >2015

		DNK			FIN	SWE
trait	h2	r500	c500	N500		
SB1	0.036	0.82	0.64	50		
CE1	0.012	0.60	0.51	47		
CS1	0.134	0.95	0.91	45		
SB2	0.012	0.60	0.57	92		
CE2	0.012	0.60	0.47	88		
CS2	0.134	0.95	0.91	86		

Current JER, RAW, BYR >2015, more bulls

		DNK			FIN	SWE
trait	h2	r100	c100	N100		
SB1	0.036	0.48	0.38	115		
CE1	0.012	0.23	0.54	113		
CS1	0.134	0.78	0.80	112		
SB2	0.012	0.23	0.25	174		
CE2	0.012	0.23	0.50	162		
CS2	0.134	0.78	0.81	158		

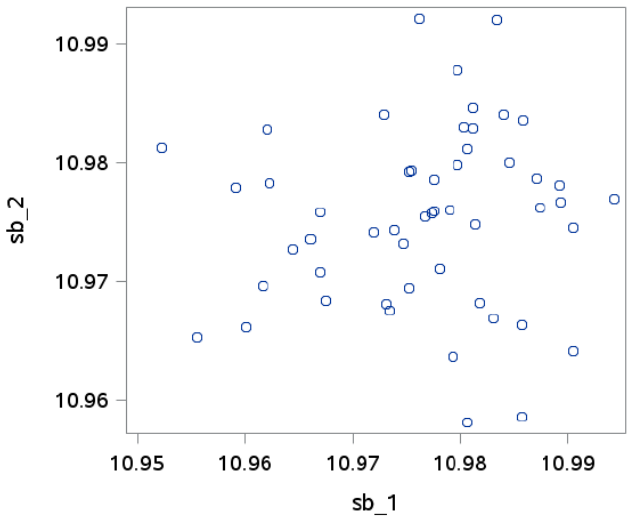
Current JER, RAW, BYR 1995-2000

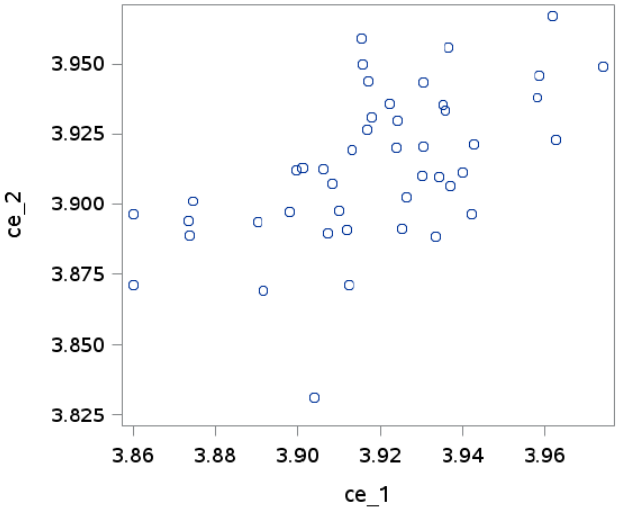
		DNK			FIN	SWE
trait	h2	r350	c350	N350		
SB1	0.036	0.76	0.81	25		
CE1	0.012	0.51	0.74	24		
CS1	0.134	0.92	0.97	24		
SB2	0.012	0.51	0.39	36		
CE2	0.012	0.51	0.76	33		
CS2	0.134	0.92	0.94	33		

Current JER, RAW, BYR 1995-2000, more bulls

		DNK			FIN	SWE
trait	h2	r80	c80	N80		
SB1	0.036	0.42	0.76	43		
CE1	0.012	0.19	0.57	41		
CS1	0.134	0.73	0.85	40		
SB2	0.012	0.19	0.19	258		
CE2	0.012	0.19	0.22	95		
CS2	0.134	0.73	0.83	82		

Example of plots: Current RDC, DNK, RAW, SB2 (corr300=0.30) and CE2 (corr300=0.62)





Means and STD for phenotypic means of bulls and fathers

Current HOL, DNK

		RAW			EDIT		
		mean	STD	N	Mean	STD	N
SB1	bull	10.947	0.017	83	10.949	0.019	82
	father	10.941	0.016		10.942	0.018	
CE1	bull	3.835	0.049	78	3.873	0.068	78
	father	3.786	0.053		3.804	0.074	
CS1	bull	2.493	0.067	78	2.484	0.078	75
	father	2.519	0.067		2.516	0.077	
SB2	bull	10.974	0.006	121	10.974	0.005	114
	father	10.975	0.005		10.975	0.005	
CE2	bull	3.904	0.023	112	3.921	0.031	106
	father	3.888	0.025		3.898	0.035	
CS2	bull	2.759	0.070	107	2.756	0.079	105
	father	2.781	0.067		2.779	0.077	

Correlation between progeny mean for bull and father and regression of bull on father progeny mean
Progeny means for bulls and for fathers are based on a minimum number of offspring. In the table you see the number of bulls (N), the regression coefficient b1 as bull on father progeny mean, the R-squared value from the regression and the correlation (c) between progeny mean of bull and progeny mean of father.

??Expectations: reg_b1 = 0.50 and reg_Rsq maximum 0.25

Current HOL, RAW

	DNK				FIN				SWE			
trait	N	reg_b1	reg_Rsq	c500	N	reg_b1	reg_Rsq	c350	N	reg_b1	reg_Rsq	c350
SB1	83	0.47	0.21	0.45	37	0.28	0.09	0.30	31	0.42	0.17	0.42
CE1	78	0.57	0.39	0.62	19	0.49	0.24	0.49	31	0.49	0.19	0.44
CS1	78	0.20	0.04	0.20								
SB2	121	0.12	0.01	0.10	57	0.34	0.07	0.27	66	0.24	0.05	0.23
CE2	112	0.44	0.24	0.49	40	0.58	0.26	0.51	66	0.29	0.06	0.25
CS2	107	0.39	0.14	0.38								

Current RDC, RAW

	DNK				FIN				SWE			
trait	N	reg_b1	reg_Rsq	c250	N	reg_b1	reg_Rsq	c350	N	reg_b1	reg_Rsq	c350
SB1	37	-0.14	0.02	-0.14	75	0.01	0.00	0.01	33	0.13	0.03	0.17
CE1	34	0.32	0.14	0.38	48	0.33	0.19	0.44	31	0.16	0.07	0.26
CS1	34	0.35	0.11	0.33								
SB2	53	0.01	0.00	0.01	108	0.26	0.07	0.26	73	0.11	0.02	0.13
CE2	50	0.50	0.29	0.54	79	0.51	0.26	0.51	72	0.13	0.01	0.12
CS2	50	0.49	0.18	0.42								

Current JER, RAW

	DNK				FIN	SWE
trait	N	reg_b1	reg_Rsq	c350		
SB1	72	0.20	0.03	0.16		
CE1	70	0.23	0.04	0.20		
CS1	69	0.31	0.10	0.32		
SB2	100	0.64	0.11	0.34		
CE2	96	-0.32	0.04	-0.20		
CS2	96	0.56	0.31	0.56		

Divided by sex of the calf

Current HOL, RAW, DNK

	ALL				MALE				FEMALE			
trait	N	reg_b1	reg_Rsq	c500	N	reg_b1	reg_Rsq	c500	N	reg_b1	reg_Rsq	c500
SB1	83	0.47	0.21	0.45	49	0.35	0.18	0.43	65	0.35	0.10	0.31
CE1	78	0.57	0.39	0.62	46	0.53	0.35	0.59	63	0.60	0.48	0.69
CS1	78	0.20	0.04	0.20	44	0.24	0.05	0.22	63	0.10	0.01	0.09
SB2	121	0.12	0.01	0.10	81	0.26	0.03	0.17	82	0.15	0.02	0.15
CE2	112	0.44	0.24	0.49	77	0.39	0.18	0.43	80	0.51	0.34	0.58
CS2	107	0.39	0.14	0.38	77	0.47	0.18	0.42	80	0.29	0.08	0.29

Current HOL, RAW, FIN

	ALL				MALE				FEMALE			
trait	N	reg_b1	reg_Rsq	c350	N	reg_b1	reg_Rsq	c200	N	reg_b1	reg_Rsq	c200
SB1	37	0.28	0.09	0.30	30	0.24	0.07	0.26	30	0.27	0.10	0.32
CE1	19	0.49	0.24	0.49	12	0.78	0.64	0.80	12	0.27	0.06	0.24
CS1												
SB2	57	0.34	0.07	0.27	54	0.12	0.01	0.09	53	0.28	0.05	0.23
CE2	40	0.58	0.26	0.51	37	0.48	0.22	0.47	36	0.47	0.18	0.42
CS2												

Current HOL, RAW, SWE

	ALL				MALE				FEMALE			
trait	N	reg_b1	reg_Rsq	c350	N	reg_b1	reg_Rsq	c200	N	reg_b1	reg_Rsq	c200
SB1	31	0.42	0.17	0.42	22	0.11	0.01	0.11	27	0.29	0.13	0.35
CE1	31	0.49	0.19	0.44	21	0.28	0.08	0.28	25	0.50	0.20	0.45
CS1												
SB2	66	0.24	0.05	0.23	61	0.27	0.08	0.28	57	-0.03	0.00	-0.04
CE2	66	0.29	0.06	0.25	58	0.01	0.00	0.01	56	-0.02	0.00	-0.02
CS2												

Current RDC, RAW, DNK

	ALL				MALE				FEMALE			
trait	N	reg_b1	reg_Rsq	c250	N	reg_b1	reg_Rsq	c150	N	reg_b1	reg_Rsq	c150
SB1	37	-0.14	0.02	-0.14	16	-0.55	0.15	-0.39	33	-0.37	0.16	-0.39
CE1	34	0.32	0.14	0.38	16	0.09	0.01	0.09	31	0.28	0.14	0.37
CS1	34	0.35	0.11	0.33	16	0.09	0.01	0.08	31	0.19	0.03	0.18
SB2	53	0.01	0.00	0.01	46	0.18	0.03	0.16	43	-0.38	0.13	-0.37
CE2	50	0.50	0.29	0.54	44	0.50	0.26	0.51	42	0.30	0.07	0.27
CS2	50	0.49	0.18	0.42	44	0.51	0.24	0.49	42	0.34	0.08	0.29

Current RDC, RAW, FIN

	ALL				MALE				FEMALE			
trait	N	reg_b1	reg_Rsq	c350	N	reg_b1	reg_Rsq	c200	N	reg_b1	reg_Rsq	c200
SB1	75	0.01	0.00	0.01	62	-0.09	0.00	-0.06	69	0.09	0.00	0.07
CE1	48	0.33	0.19	0.44	39	0.33	0.16	0.40	37	0.24	0.11	0.33
CS1												
SB2	108	0.26	0.07	0.26	101	0.18	0.03	0.17	97	0.32	0.11	0.34
CE2	79	0.51	0.26	0.51	68	0.53	0.31	0.55	63	0.29	0.10	0.32
CS2												

Current RDC, RAW, SWE

	ALL				MALE				FEMALE			
trait	N	reg_b1	reg_Rsq	c350	N	reg_b1	reg_Rsq	c200	N	reg_b1	reg_Rsq	c200
SB1	33	0.13	0.03	0.17	26	0.21	0.05	0.22	28	0.00	0.00	0.00
CE1	31	0.16	0.07	0.26	26	0.13	0.07	0.27	28	0.10	0.02	0.15
CS1												
SB2	73	0.11	0.02	0.13	63	0.02	0.00	0.02	60	0.32	0.13	0.36
CE2	72	0.13	0.01	0.12	62	0.04	0.00	0.04	60	0.21	0.04	0.20
CS2												

Current JER, RAW, DNK

	ALL				MALE				FEMALE			
trait	N	reg_b1	reg_Rsq	c350	N	reg_b1	reg_Rsq	c250	N	reg_b1	reg_Rsq	c250
SB1	72	0.20	0.03	0.16	29	0.22	0.03	0.17	63	0.15	0.02	0.13
CE1	70	0.23	0.04	0.20	22	0.24	0.01	0.10	60	0.26	0.05	0.23
CS1	69	0.31	0.10	0.32	20	0.25	0.06	0.25	60	0.41	0.19	0.43
SB2	100	0.64	0.11	0.34	79	0.29	0.03	0.18	92	0.17	0.01	0.12
CE2	96	-0.32	0.04	-0.20	76	0.17	0.04	0.21	92	-0.41	0.03	-0.16
CS2	96	0.56	0.31	0.56	74	0.54	0.28	0.53	92	0.42	0.22	0.47

Including BxD for maternal traits

Table of number of purebred and BxD (later lactations) calves by country and dam breed and birth year.

breed	country		2015	2016	2017	2018	2019	2020	2021	2022	total
HOL	DNK	Pure	146608	144945	136060	129047	125441	122208	117853	20545	942707
		BxD	15174	24371	40169	42003	43492	45756	53220	11232	275417
		%BxD	9%	14%	23%	25%	26%	27%	31%	35%	23%
RDC	DNK	Pure	16495	14926	13511	13357	12622	11507	11029	1876	95323
		BxD	2077	3174	4214	3750	3765	3759	3870	739	25348
		%BxD	11%	18%	24%	22%	23%	25%	26%	28%	21%
JER	DNK	Pure	36563	34620	33345	34493	32339	29589	27836	4144	232929
		BxD	4643	5179	6446	5126	6723	9939	13492	3140	54688
		%BxD	11%	13%	16%	13%	17%	25%	33%	43%	19%
HOL	FIN	Pure	33613	34298	33105	29564	27645	27196	26665	4362	216448
		BxD	8790	10878	13883	16710	19062	20507	22468	3662	115960
		%BxD	21%	24%	30%	36%	41%	43%	46%	46%	35%
RDC	FIN	Pure	51976	47381	41696	37413	32361	29840	26837	4349	271853
		BxD	15600	17732	20702	22614	23220	22760	22012	3202	147842
		%BxD	23%	27%	33%	38%	42%	43%	45%	42%	35%
HOL	SWE	Pure	38114	35704	32459	30546	28872	28023	26650	4476	224844
		BxD	4007	5501	6632	6239	6491	7136	8197	1488	45691
		%BxD	10%	13%	17%	17%	18%	20%	24%	25%	17%
RDC	SWE	Pure	37623	33083	27242	25988	23589	22533	20121	3051	193230
		BxD	4376	5694	6017	5358	5101	5288	5698	994	38526
		%BxD	10%	15%	18%	17%	18%	19%	22%	25%	17%

For each dam breed and country the phenotypic means is calculated.
Limits:

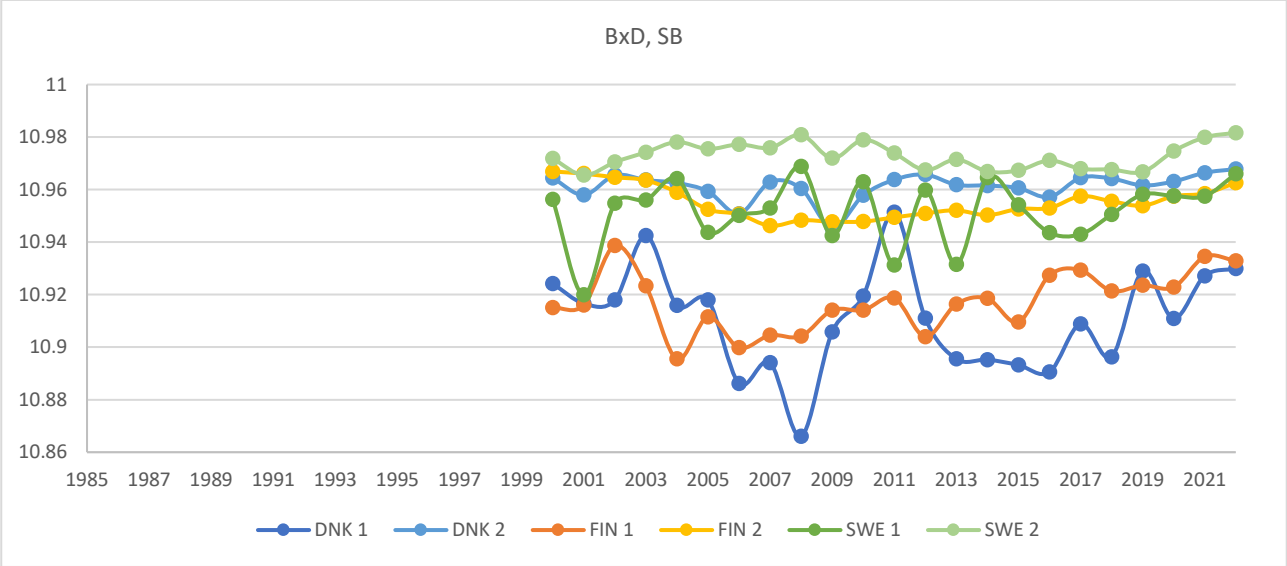
- Calves born >=2015
  Dam either HOL, RDC or JER
  For purebred calves the sire is AI bull
  For all calves the maternal grandsire is AI bull
  Total number of purebred calves > minimum limit
  Total number of all calves (pure + BxD) is 25% bigger than number of purebred calves

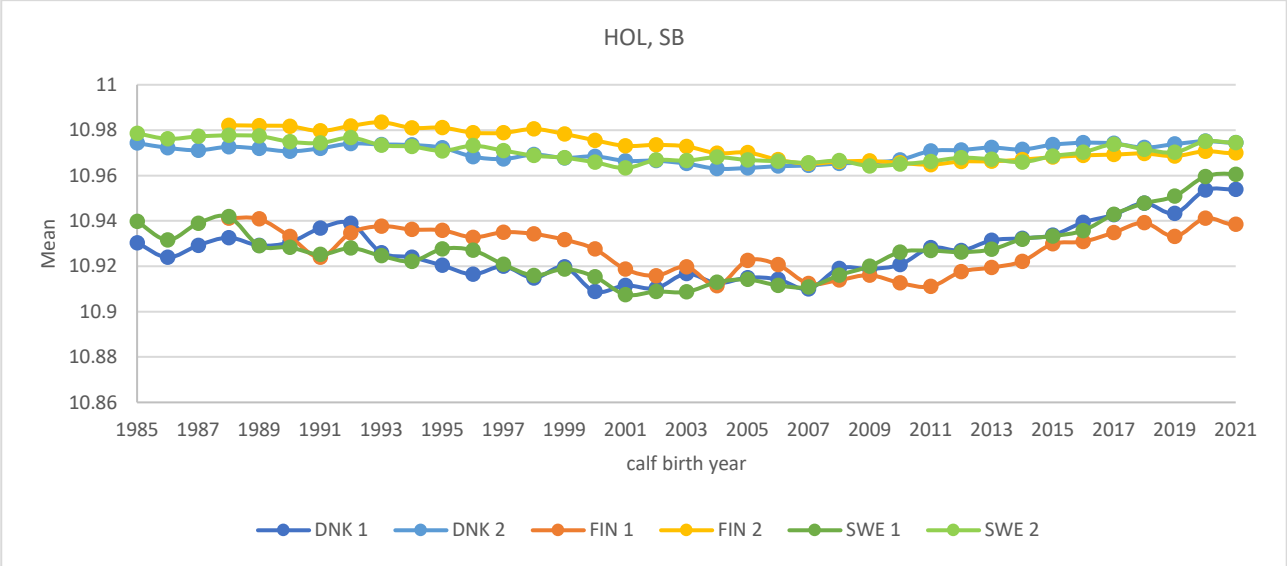
Correlations (c) between phenotypic means of two randomly divided groups of (later lactations) calves for each mgs. When including BxD the correlations increase for almost all.

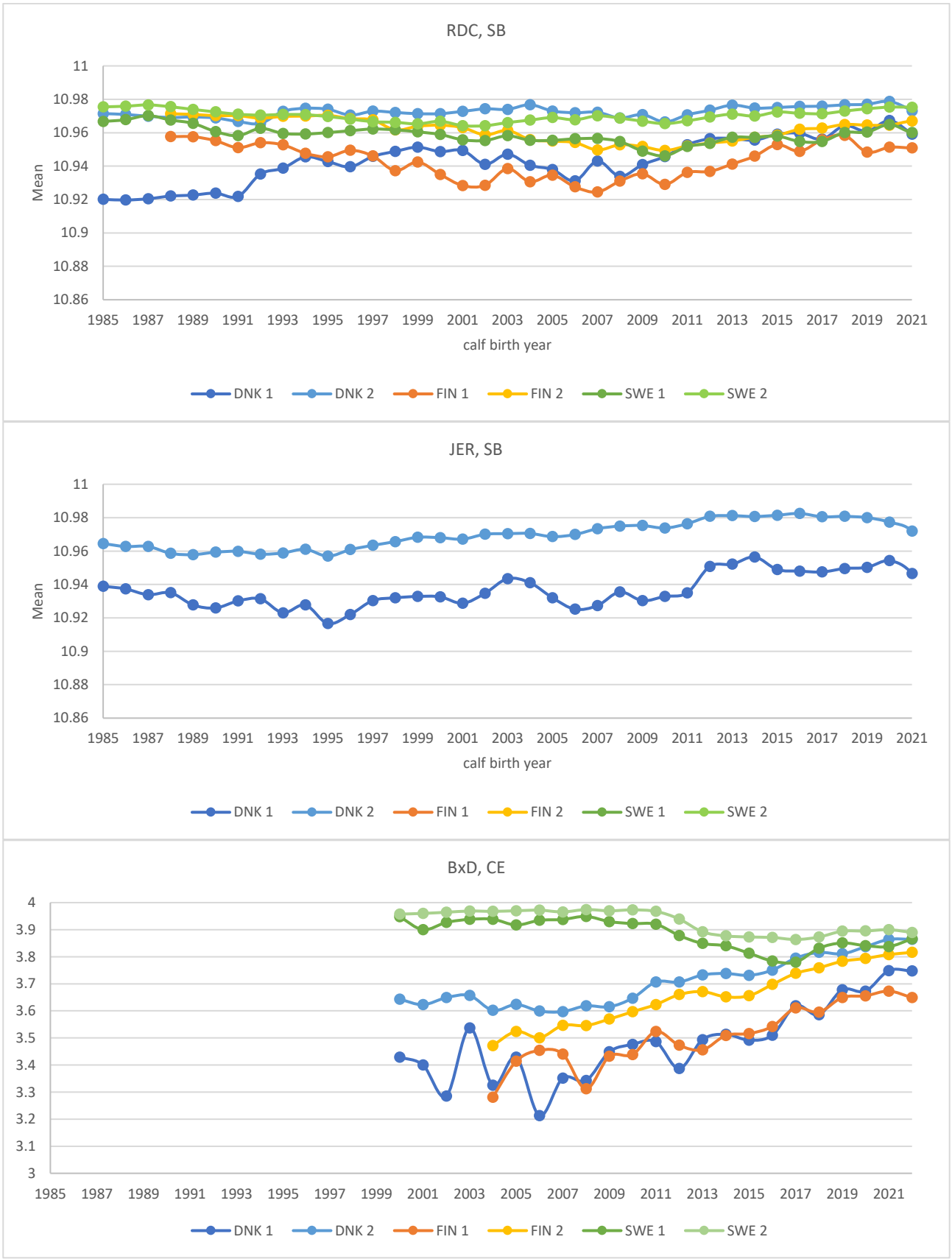
trait	Country breed	N_mgs	min	mean_pure	Mean_all	c_pure	c_all
ce	dnkHOL	137	400	1640	2165	0.74	0.83
ce	dnkRDC	52	200	534	705	0.58	0.71
ce	dnkJER	60	200	799	1052	0.45	0.64
ce	finHOL	82	400	1006	1381	0.77	0.82
ce	finRDC	91	400	1122	1646	0.82	0.90
ce	sweHOL	9	100	178	243	0.34	0.47
ce	sweRDC	14	200	430	549	0.52	0.40
sb	dnkHOL	136	400	1733	2286	0.31	0.41
sb	dnkRDC	56	200	543	717	-0.14	-0.06
sb	dnkJER	54	200	885	1158	0.19	0.23
sb	finHOL	112	400	1198	1622	0.85	0.90
sb	finRDC	138	400	1307	1879	0.87	0.91
sb	sweHOL	11	100	169	228	0.75	0.50
sb	sweRDC	15	200	435	557	0.40	0.53

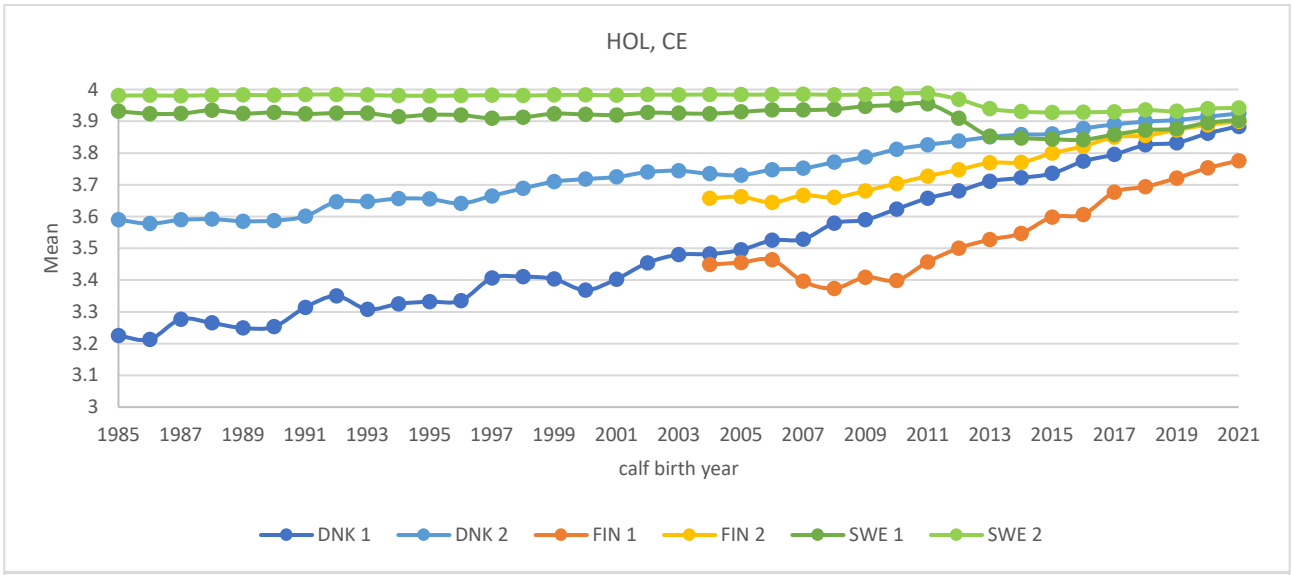
Phenotypic means by birth year

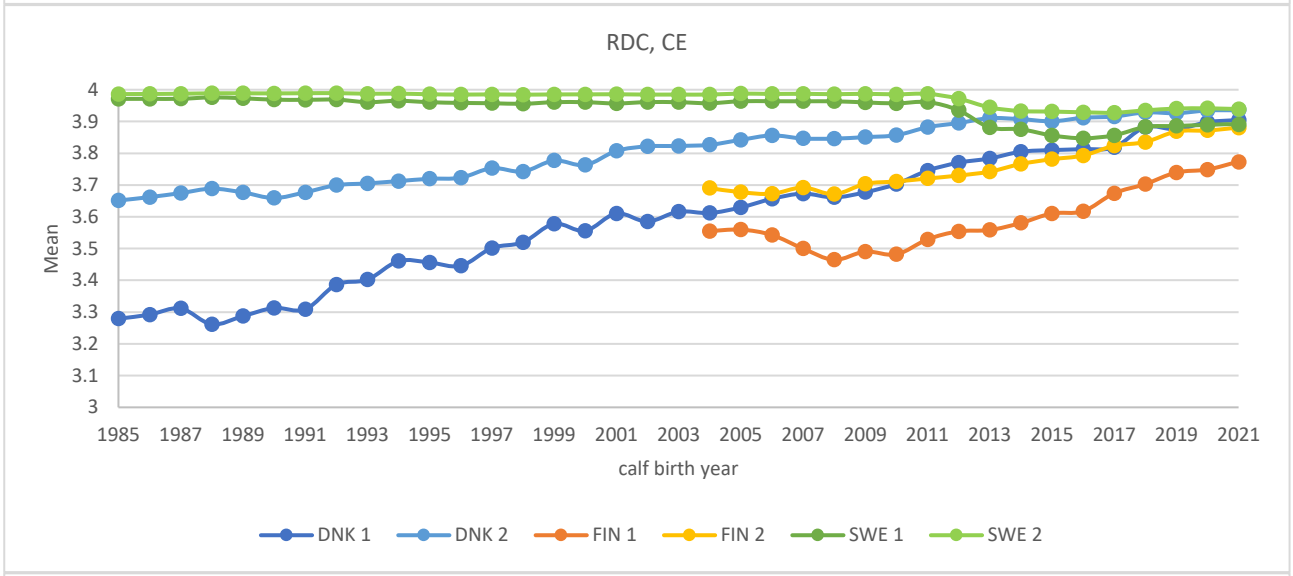
The std of the mean is bigger for BxD than for purebred calves for SB and CE, but same for CS (results not shown).

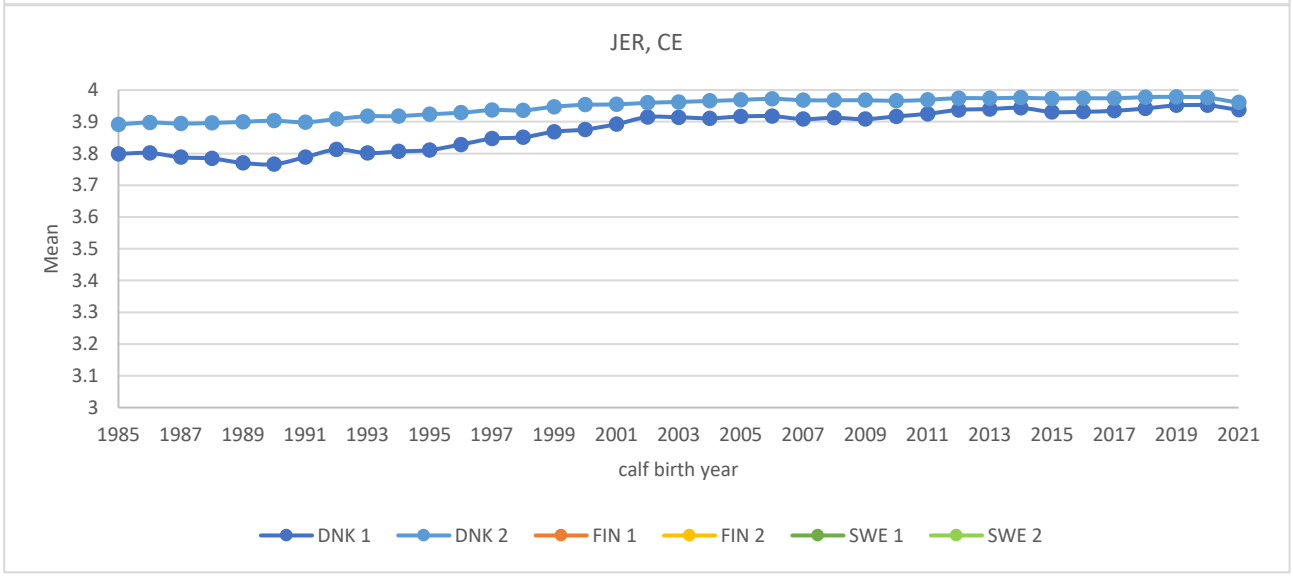


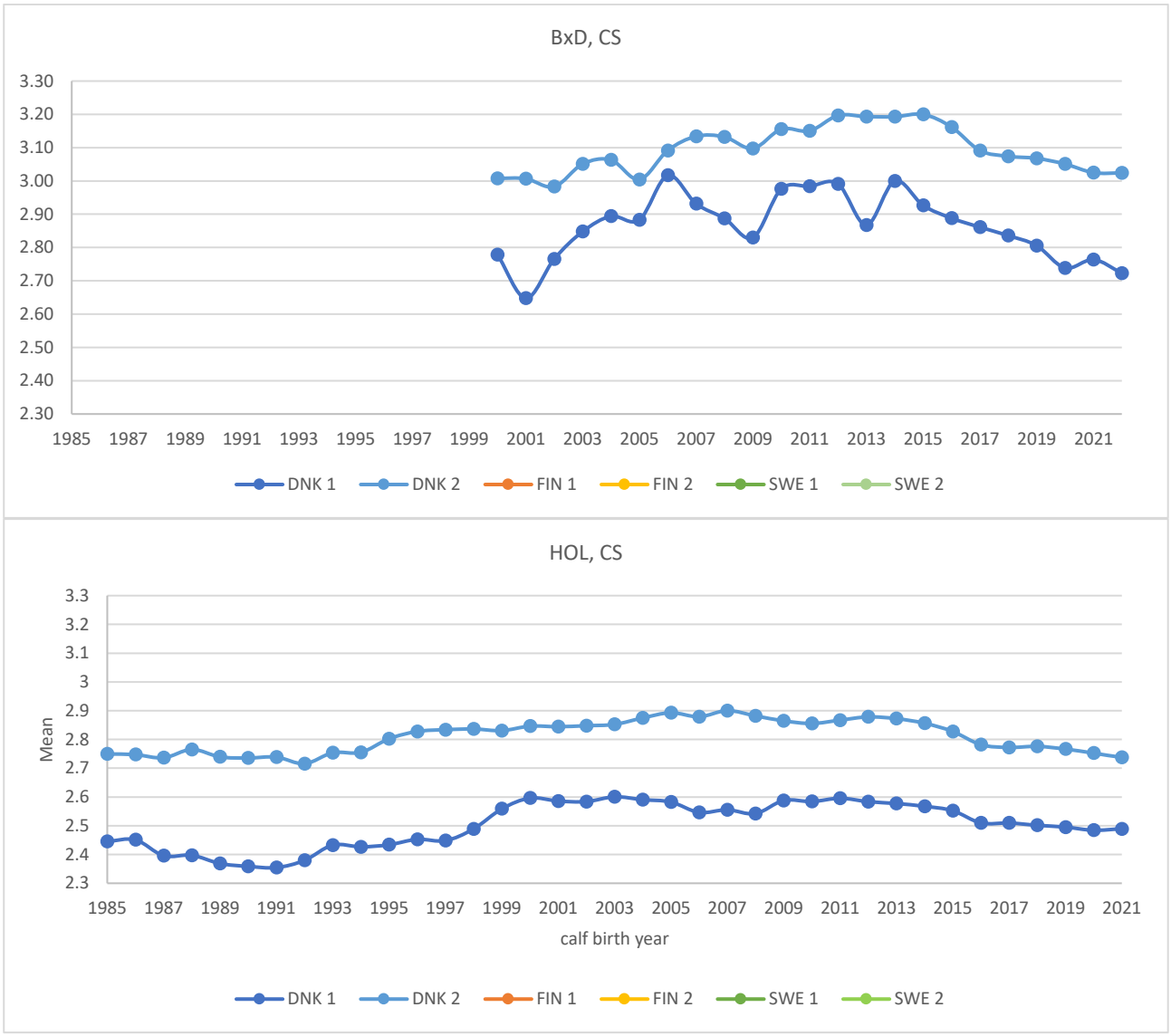


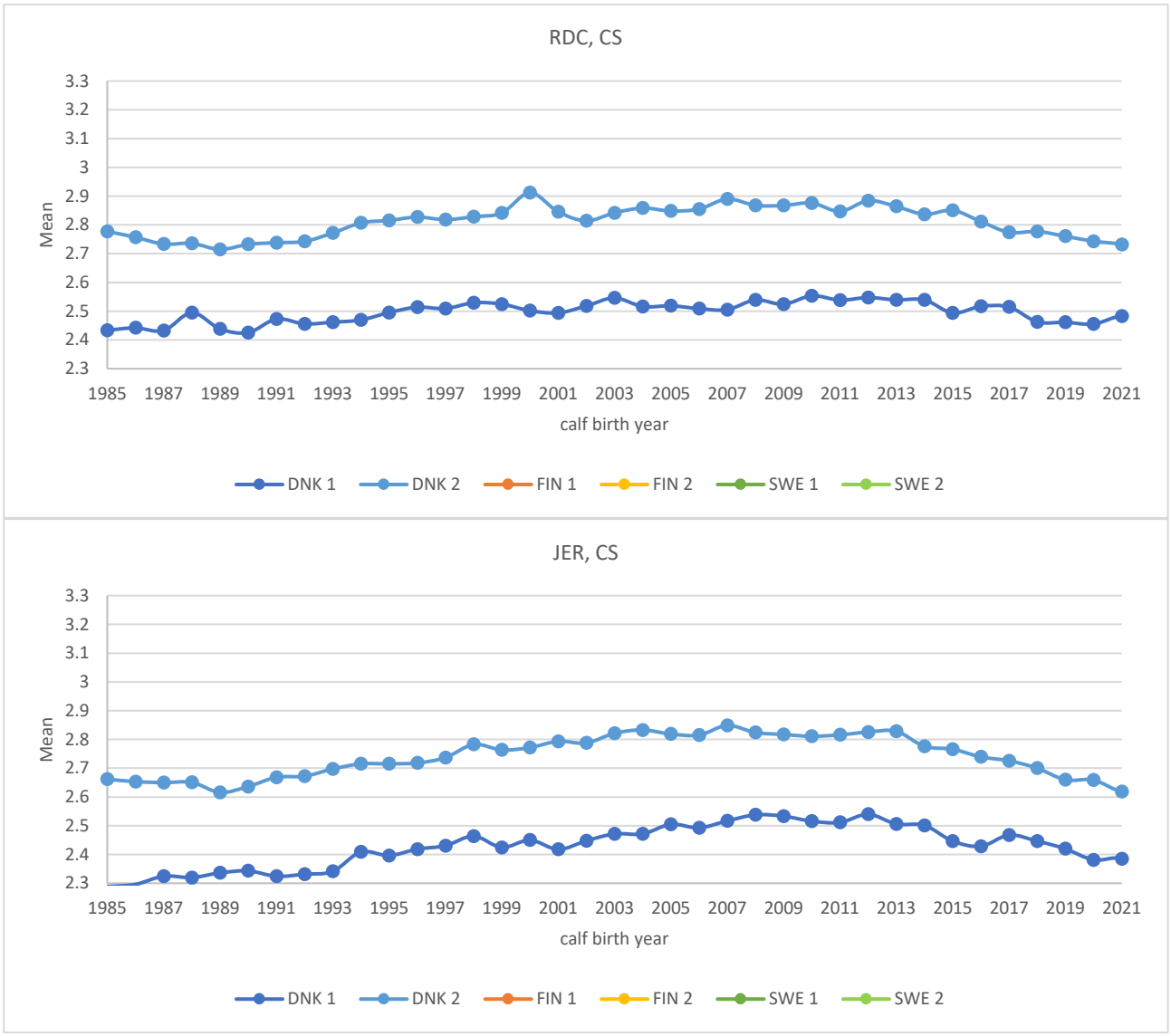

RDC, SB
Mean
11
10.98
10.96
10.94
10.92
10.9
10.88
10.86
1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019 2021
calf birth year
DNK 1
DNK 2
FIN 1
FIN 2
SWE 1
SWE 2
JER, SB
Mean
11
10.98
10.96
10.94
10.92
10.9
10.88
10.86
1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019 2021
calf birth year
DNK 1
DNK 2
FIN 1
FIN 2
SWE 1
SWE 2
BxD, CE
4
3.9
3.8
3.7
3.6
3.5
3.4
3.3
3.2
3.1
3
1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019 2021
DNK 1
DNK 2
FIN 1
FIN 2
SWE 1
SWE 2


HOL, CE
Mean
4
3.9
3.8
3.7
3.6
3.5
3.4
3.3
3.2
3.1
3
1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019 2021
calf birth year
DNK 1
DNK 2
FIN 1
FIN 2
SWE 1
SWE 2


RDC, CE
Mean
4
3.9
3.8
3.7
3.6
3.5
3.4
3.3
3.2
3.1
3
1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019 2021
calf birth year
DNK 1
DNK 2
FIN 1
FIN 2
SWE 1
SWE 2


JER, CE
Mean
4
3.9
3.8
3.7
3.6
3.5
3.4
3.3
3.2
3.1
3
1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019 2021
calf birth year
DNK 1
DNK 2
FIN 1
FIN 2
SWE 1
SWE 2

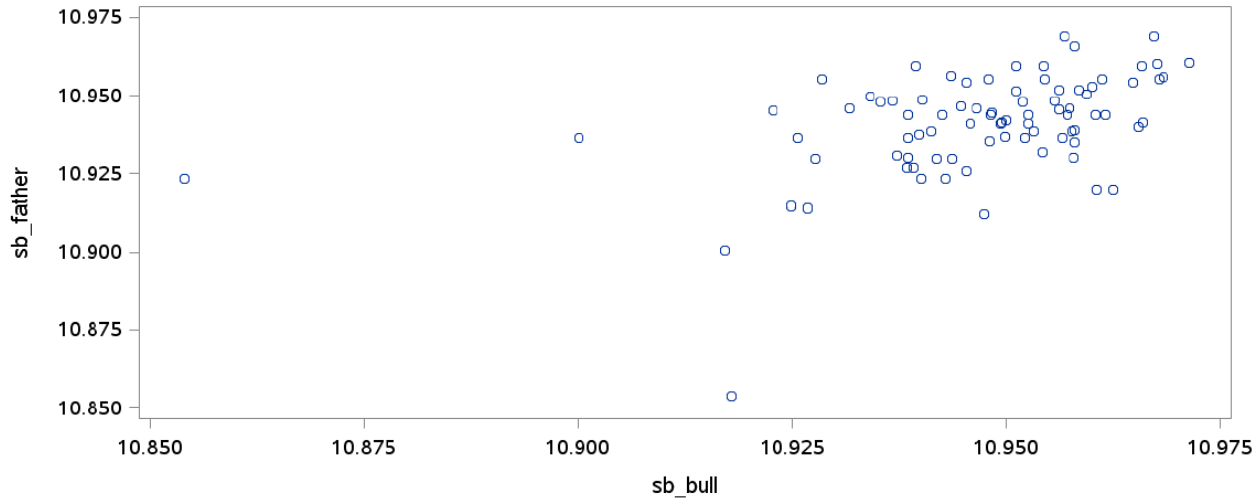

BxD, CS
3.30
3.20
3.10
3.00
2.90
2.80
2.70
2.60
2.50
2.40
2.30
1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019 2021
DNK 1
DNK 2
FIN 1
FIN 2
SWE 1
SWE 2
HOL, CS
Mean
3.3
3.2
3.1
3
2.9
2.8
2.7
2.6
2.5
2.4
2.3
1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015 2017 2019 2021
calf birth year
DNK 1
DNK 2
FIN 1
FIN 2
SWE 1
SWE 2



Below you find plots of bull means and father means

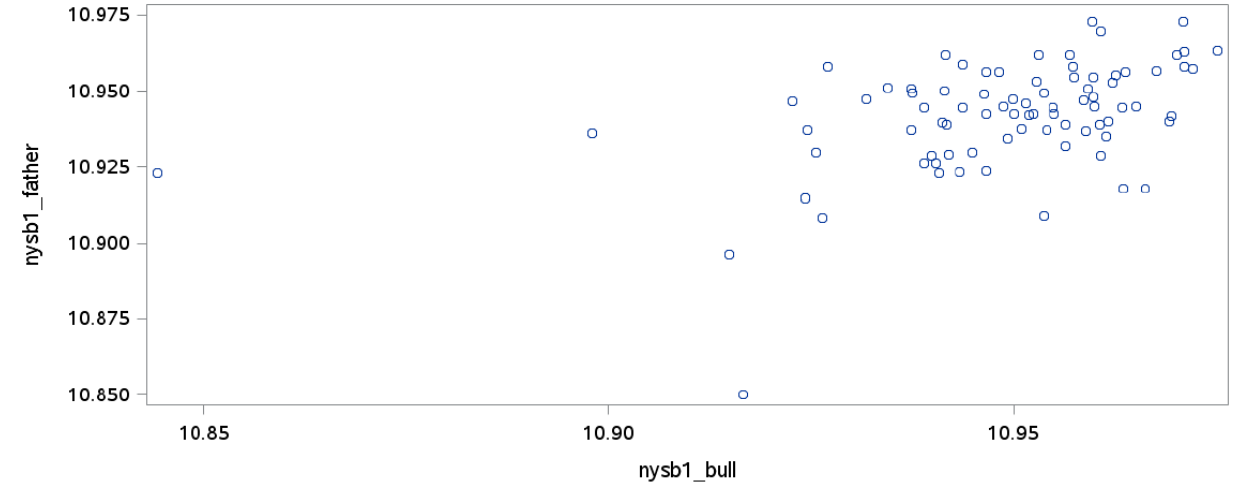
the plots are shown for Danish HOL calves, and there is a minimum of 500 calves behind each mean. The bull and the father of the bull are AI bulls. For each trait the plot is shown for RAW (raw data), EDIT (edit data, same as used in evaluation), RAW male (raw data but only male calves), RAW female (Raw data but only female calves)

RAW, DNK SB1, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



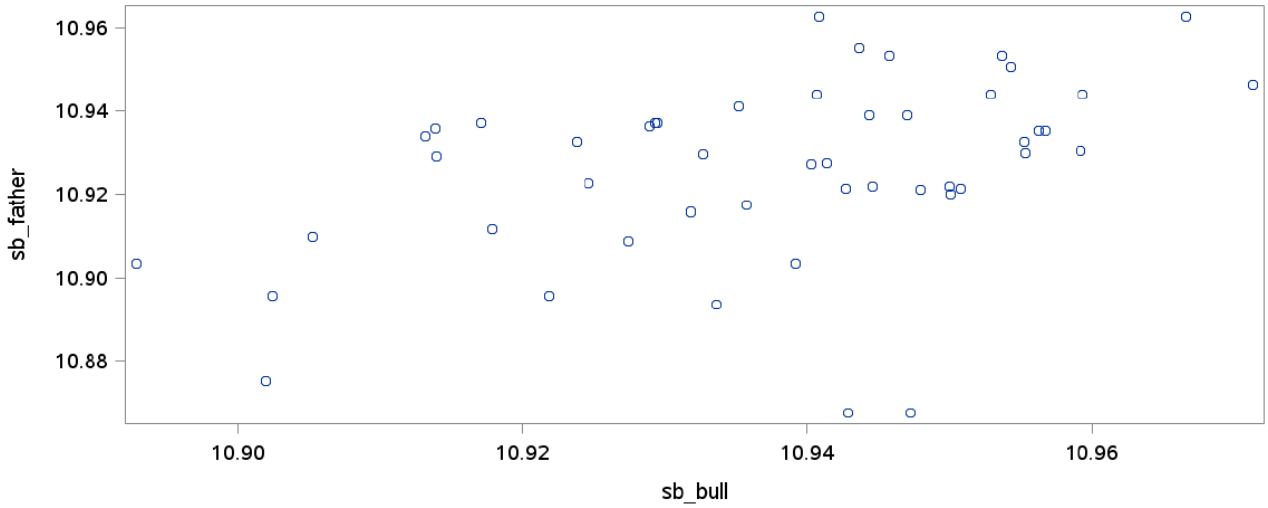
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	1	1	83	0.46640	0.20578	0.45363	83

EDIT, DNK SB1, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



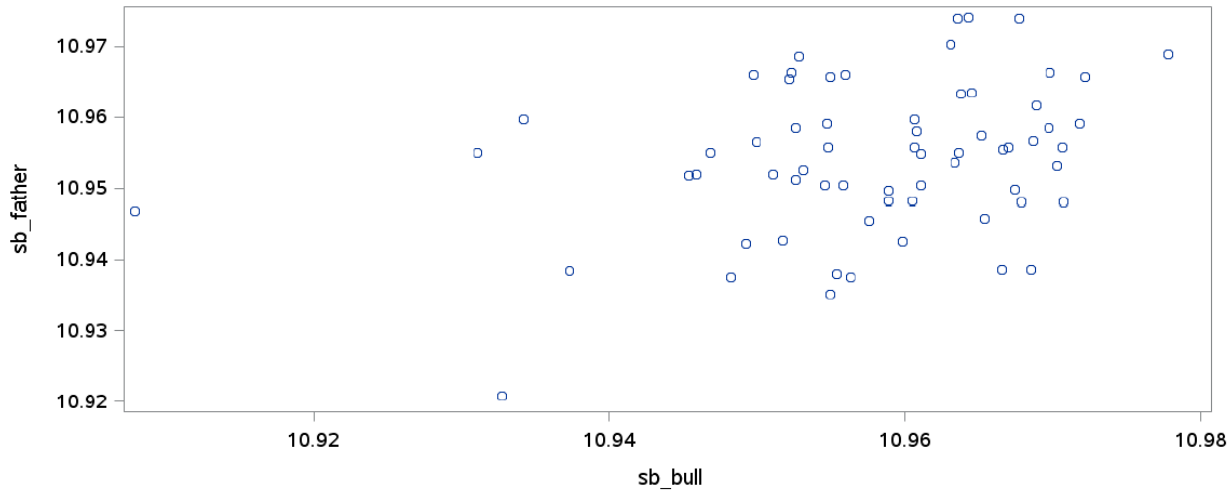
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	1	1	82	0.46206	0.19639	0.44316	82

RAW MALE, DNK SB1, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



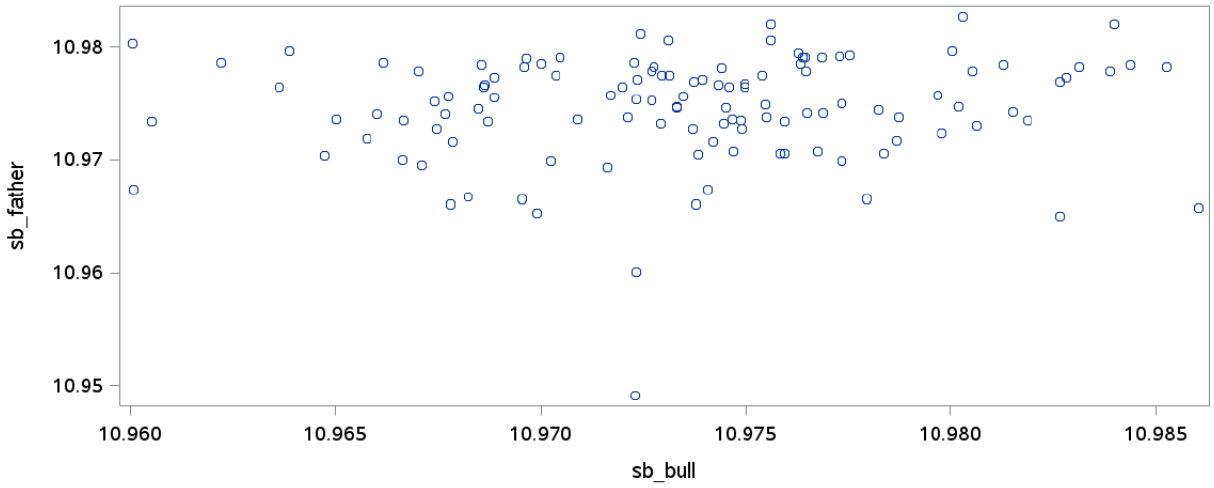
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	1	1	49	0.34555	0.18065	0.42503	49

RAW FEMALE, DNK SB1, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



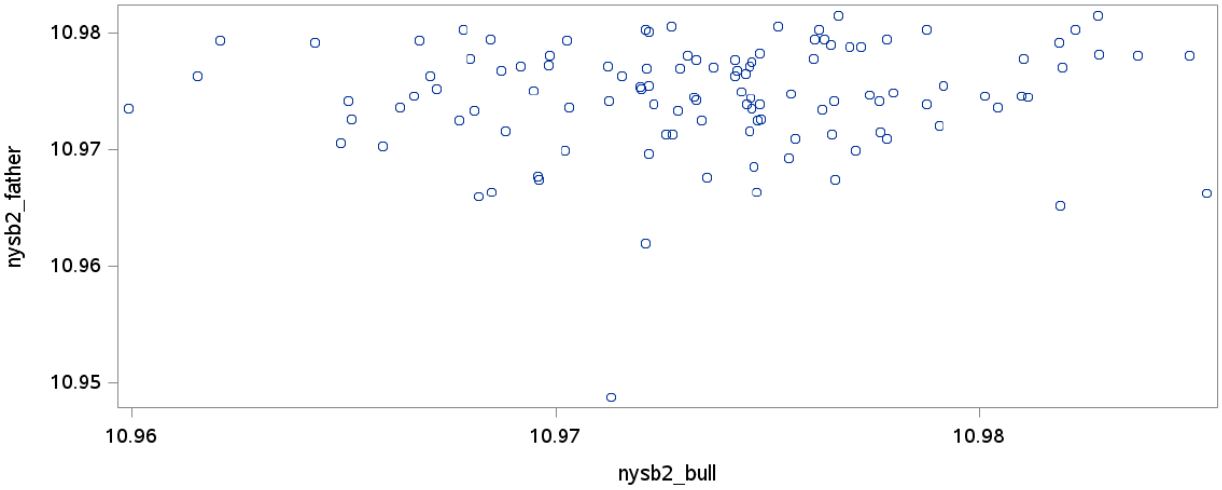
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	1	1	65	0.34804	0.098995	0.31463	65

RAW, DNK SB2, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



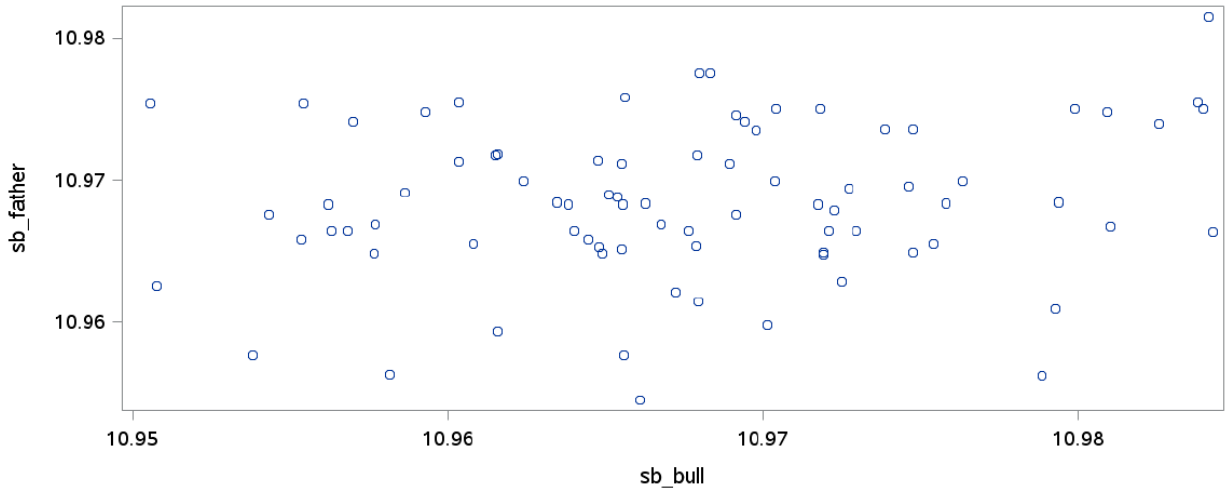
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	4	1	121	0.11657	0.010230	0.10114	121

EDIT, DNK SB2, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



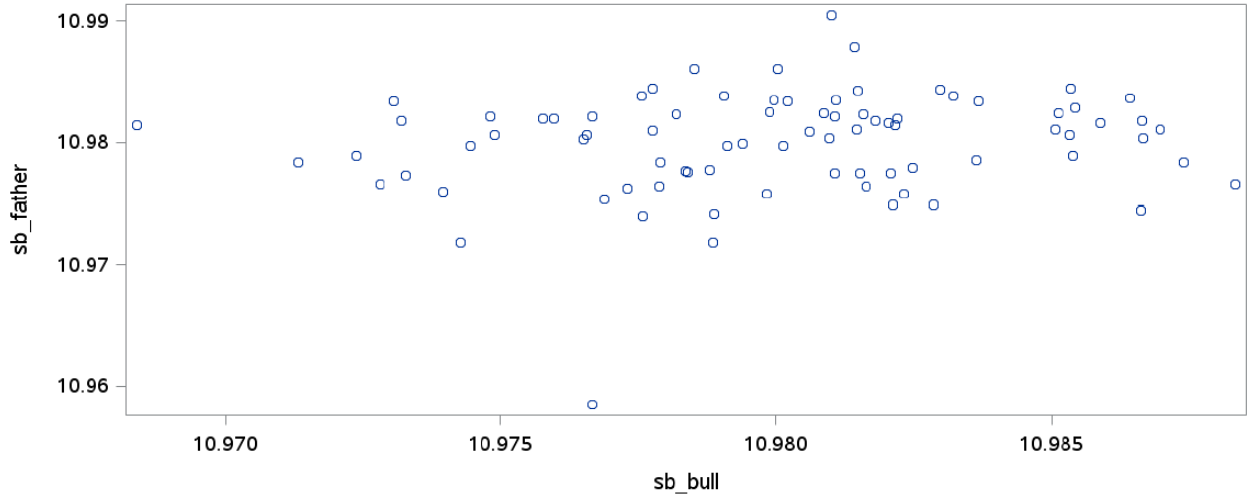
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	4	1	114	0.089328	.006886094	0.082982	114

RAW MALE, DNK SB2, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



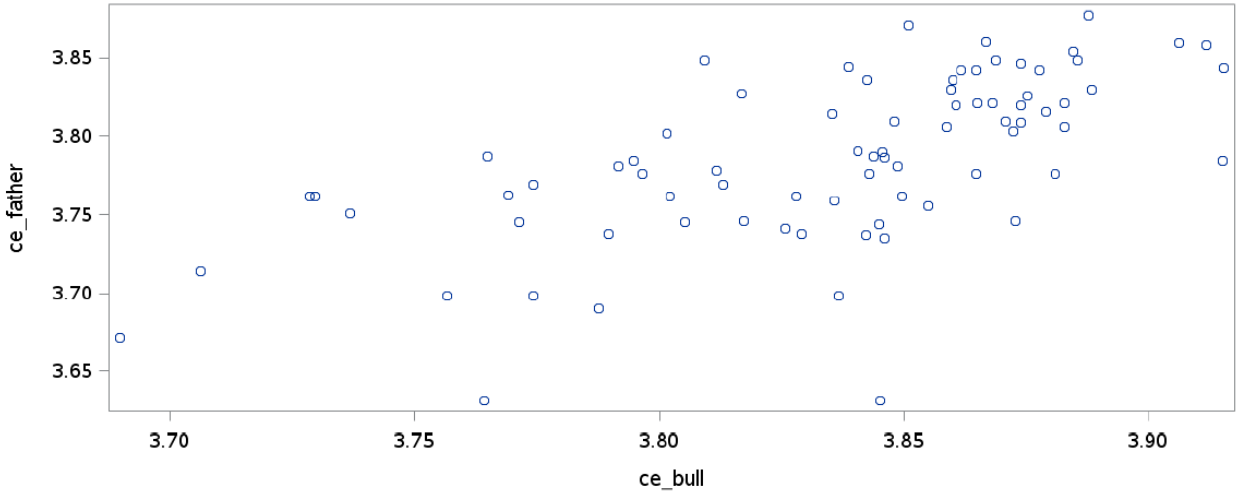
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	4	1	81	0.26379	0.030588	0.17489	81

RAW FEMALE, DNK SB2, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



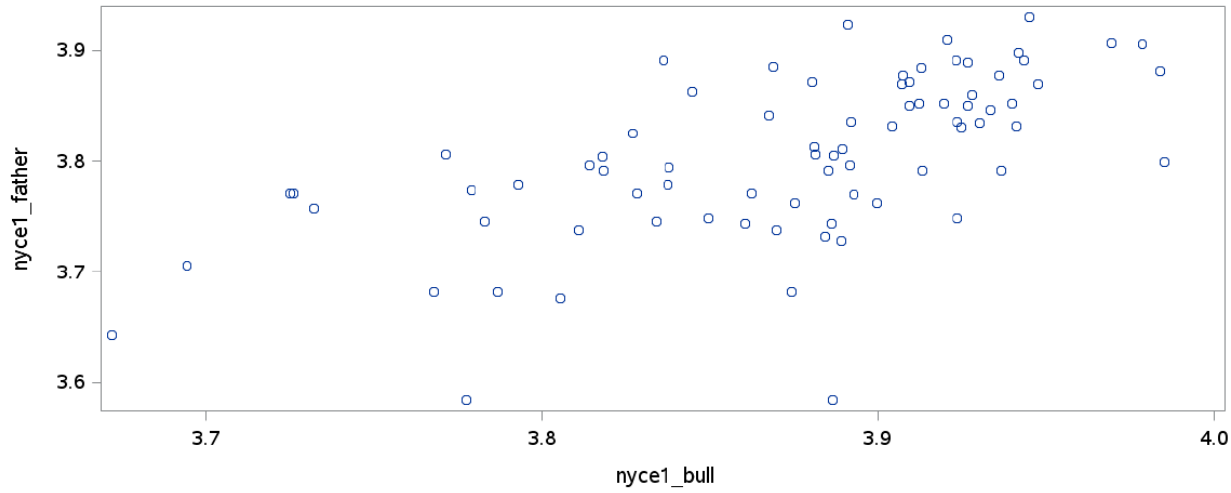
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	4	1	82	0.14768	0.022670	0.15057	82

RAW, DNK CE1, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



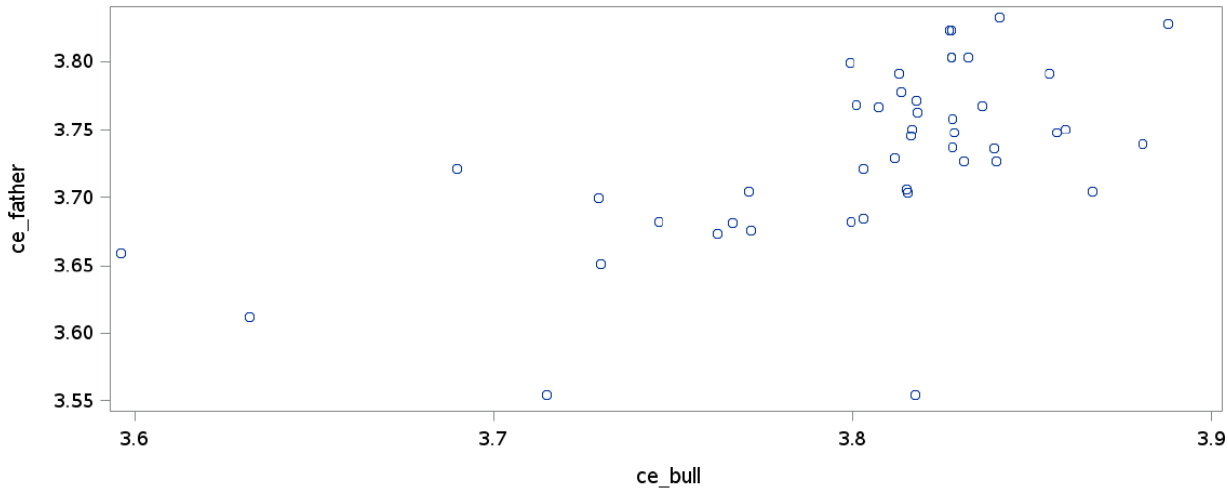
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	2	1	78	0.57098	0.38685	0.62198	78

EDIT, DNK CE1, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



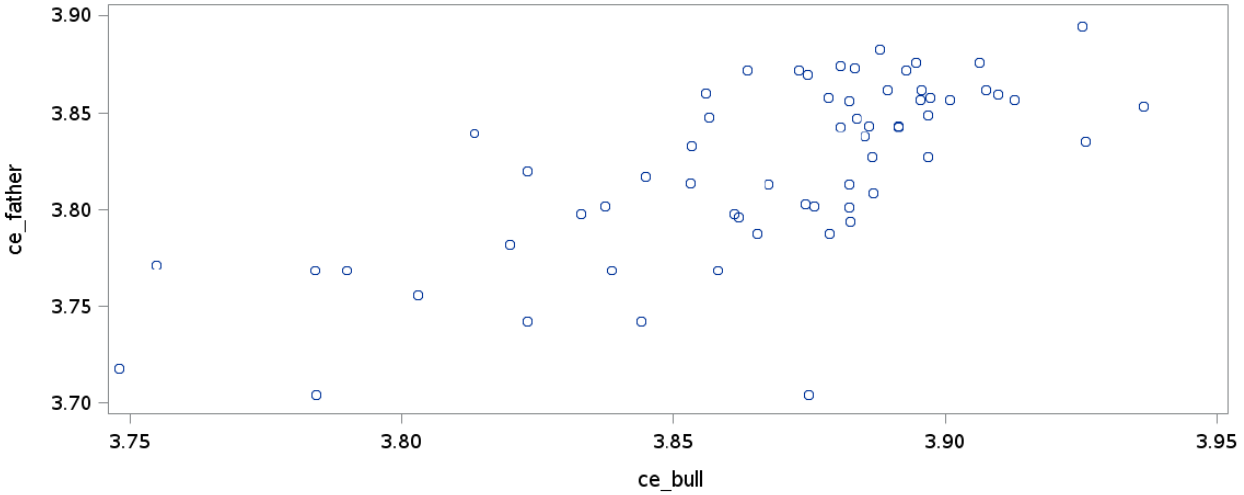
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	2	1	78	0.55795	0.37168	0.60966	78

RAW MALE, DNK CE1, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



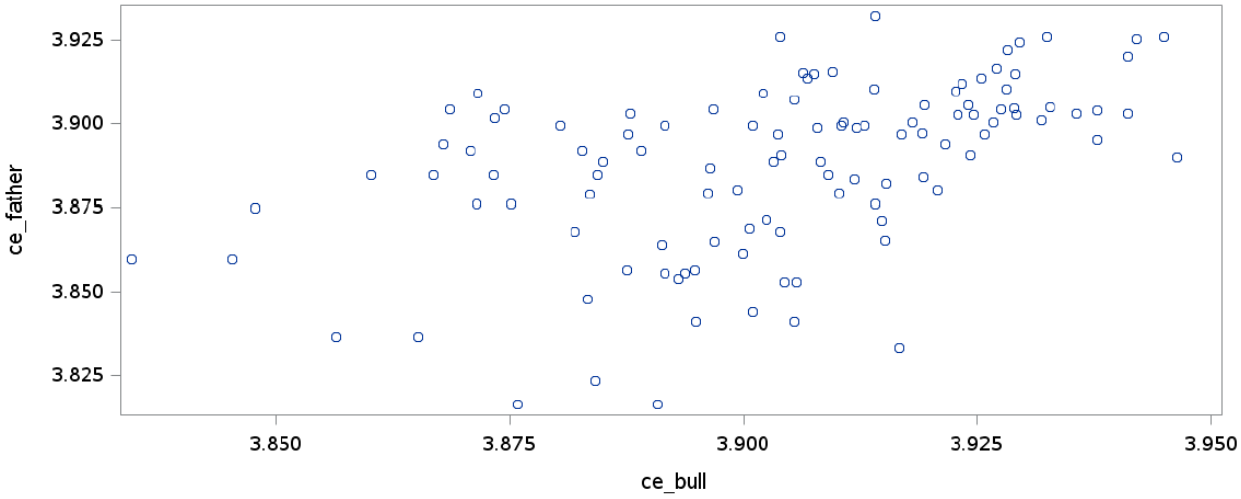
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	2	1	46	0.53323	0.34553	0.58781	46

RAW FEMALE, DNK CE1, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



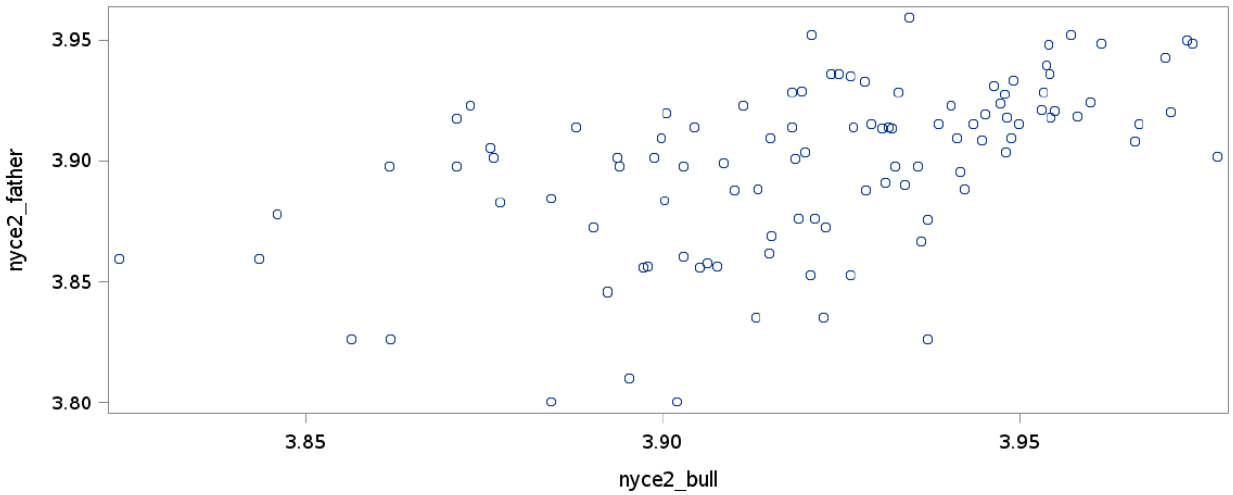
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	2	1	63	0.59855	0.48286	0.69488	63

RAW, DNK CE2 , calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



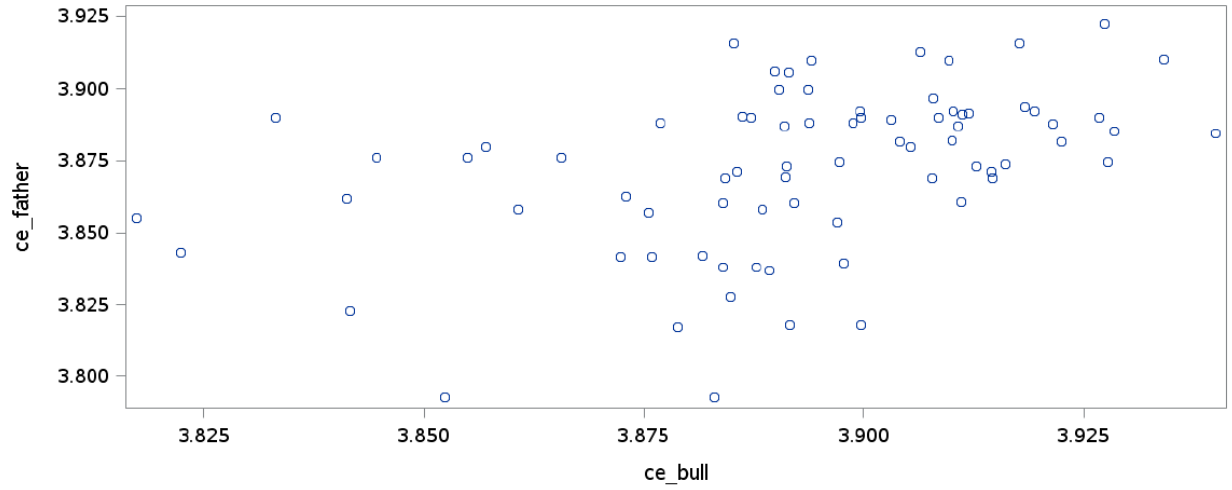
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	5	1	112	0.44447	0.23575	0.48554	112

EDIT, DNK CE2 , calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



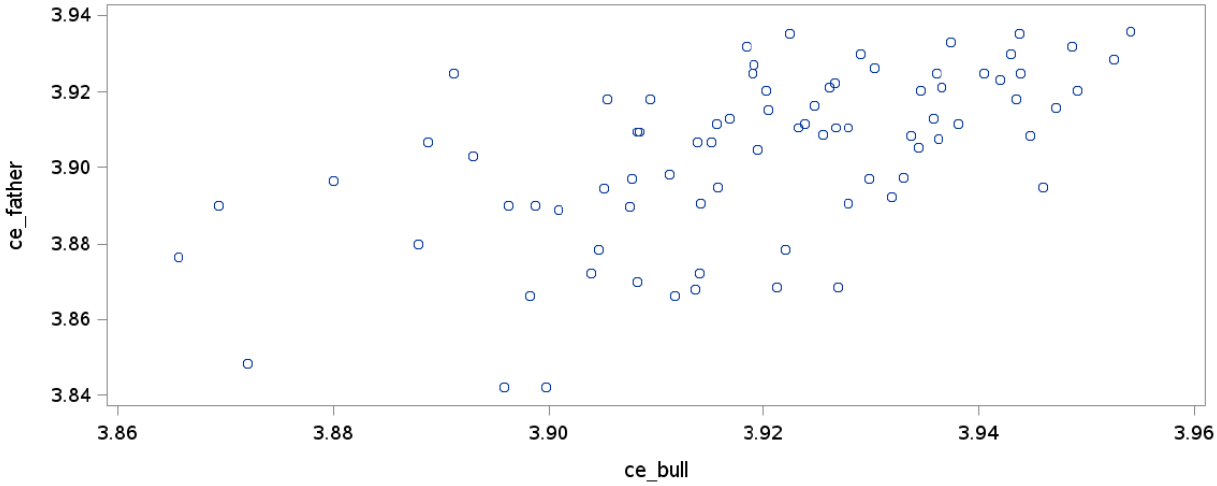
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	5	1	106	0.47091	0.27483	0.52425	106

RAW MALE, DNK CE2, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



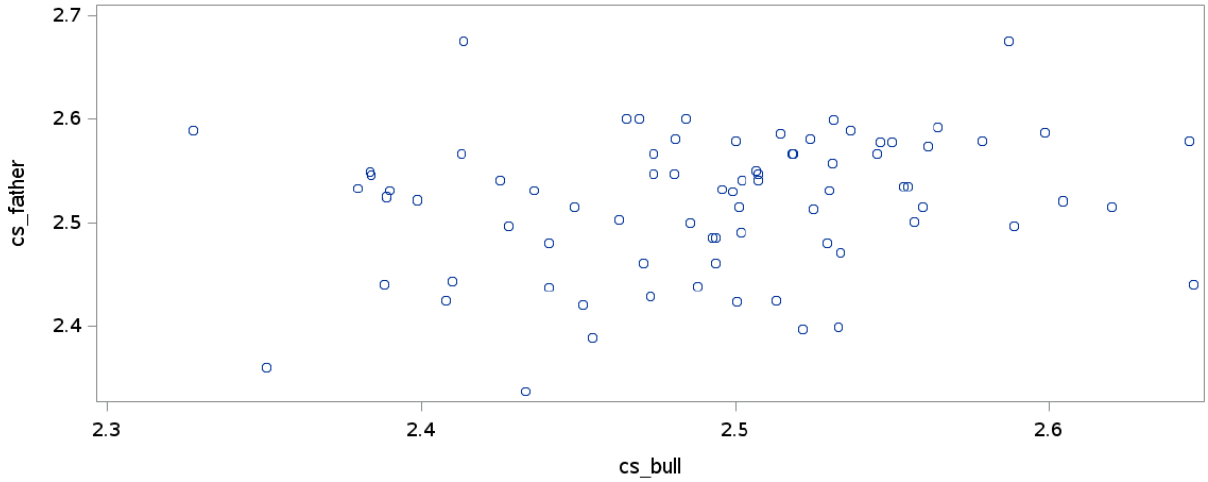
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	5	1	77	0.38866	0.18461	0.42966	77

RAW FEMALE, DNK CE2, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



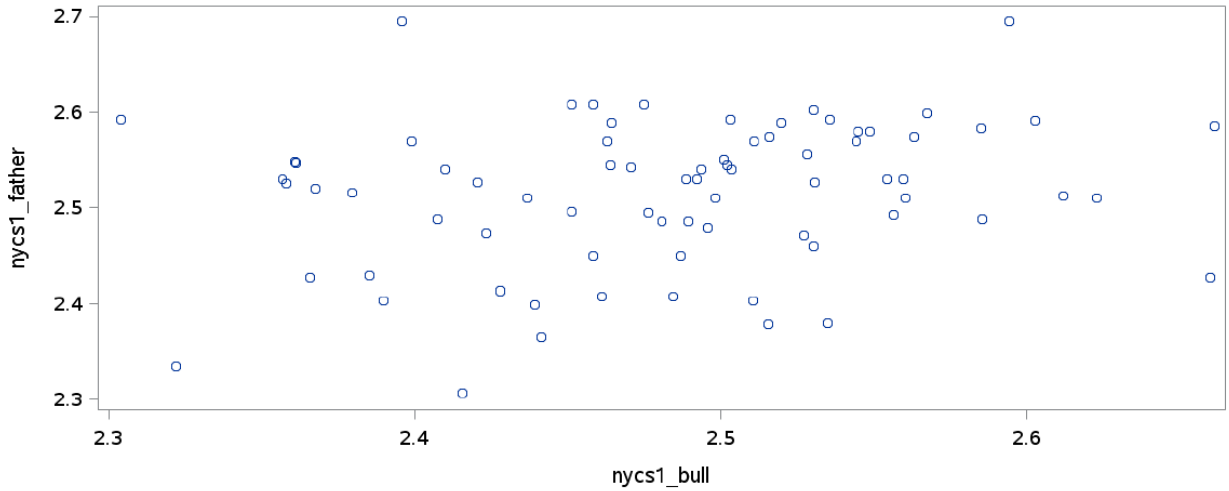
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	5	1	80	0.50818	0.33787	0.58127	80

RAW, DNK CS1 , calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



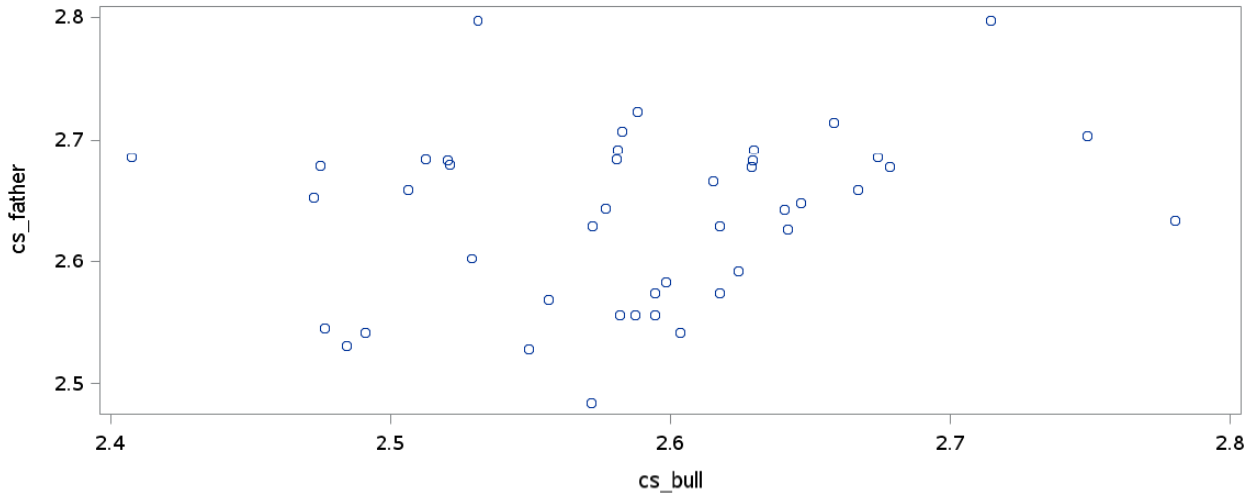
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	3	1	78	0.20446	0.041833	0.20453	78

EDIT, DNK CS1 , calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



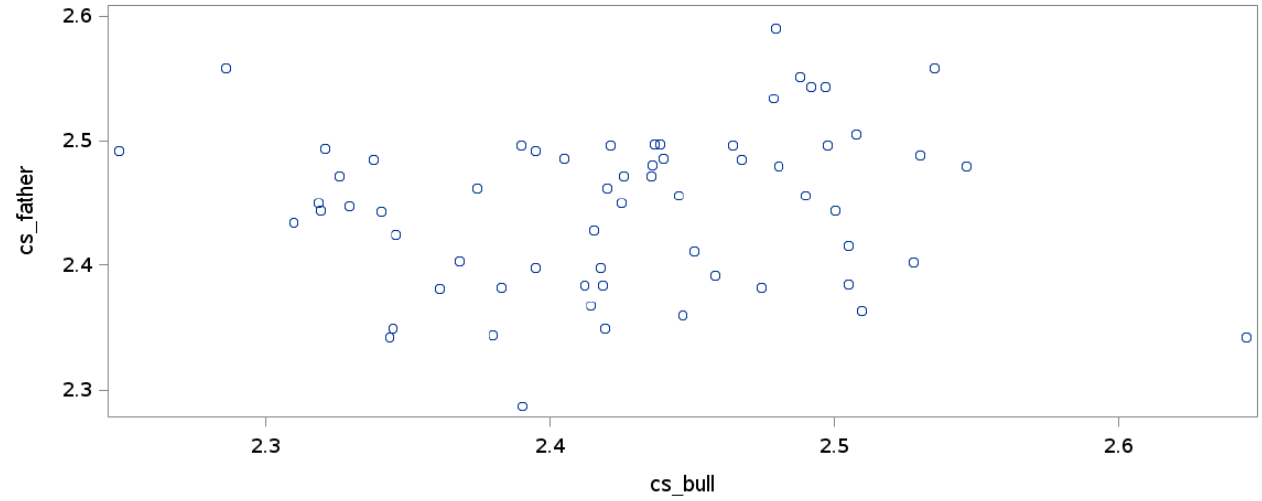
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	3	1	75	0.21443	0.045234	0.21268	75

RAW MALE, DNK CS1, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



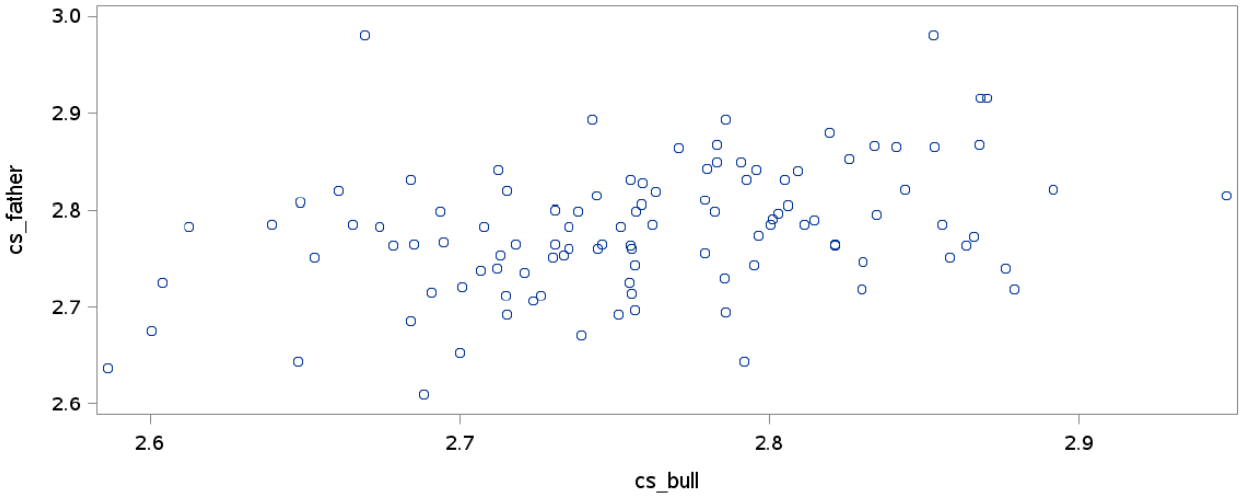
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	3	1	44	0.23933	0.049321	0.22208	44

RAW FEMALE, DNK CS1, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



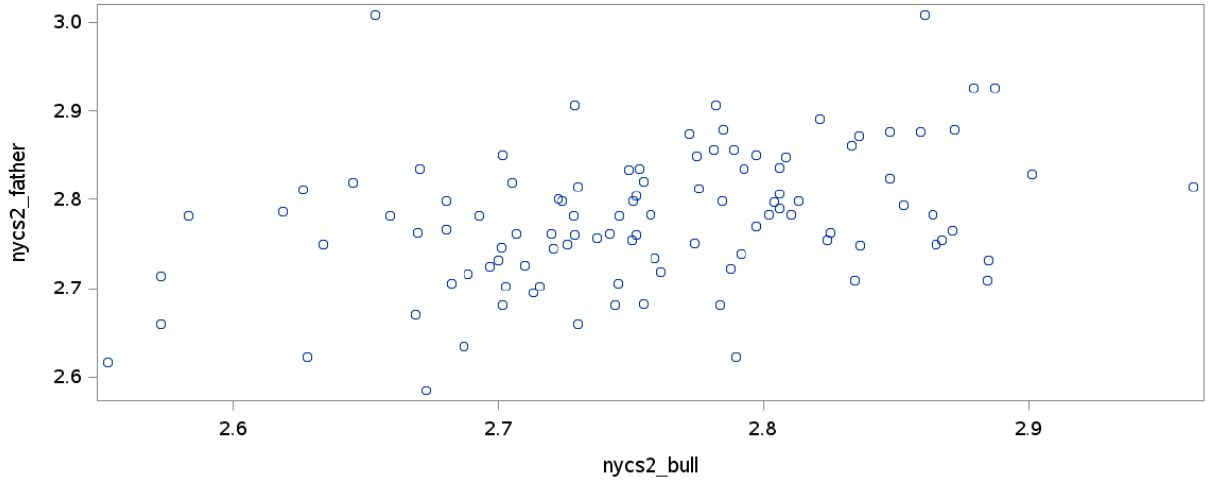
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	3	1	63	0.097758	.007292101	0.085394	63

RAW, DNK CS2, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



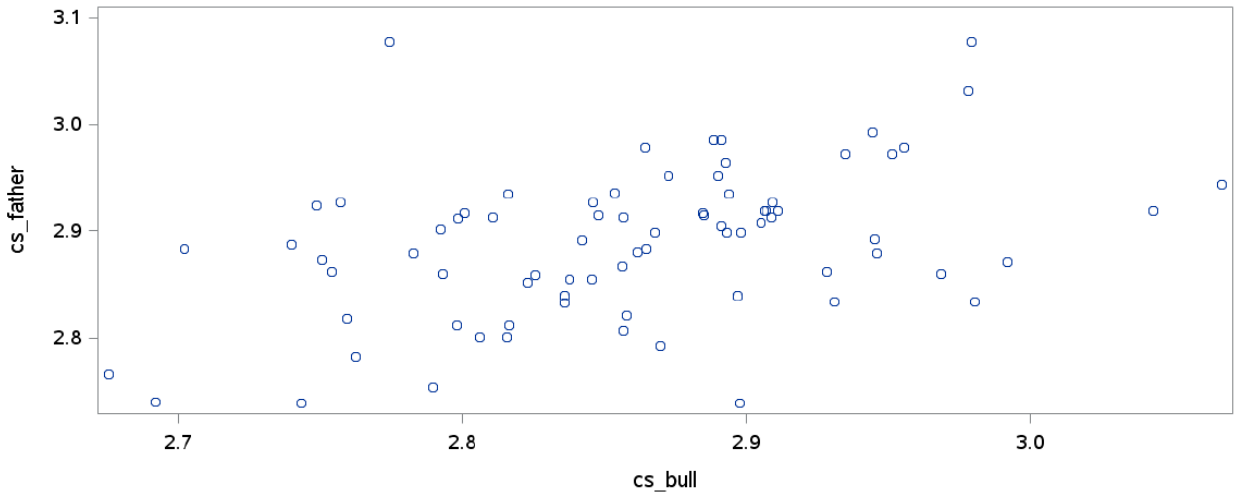
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	6	1	107	0.39113	0.14166	0.37637	107

EDIT, DNK CS2, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



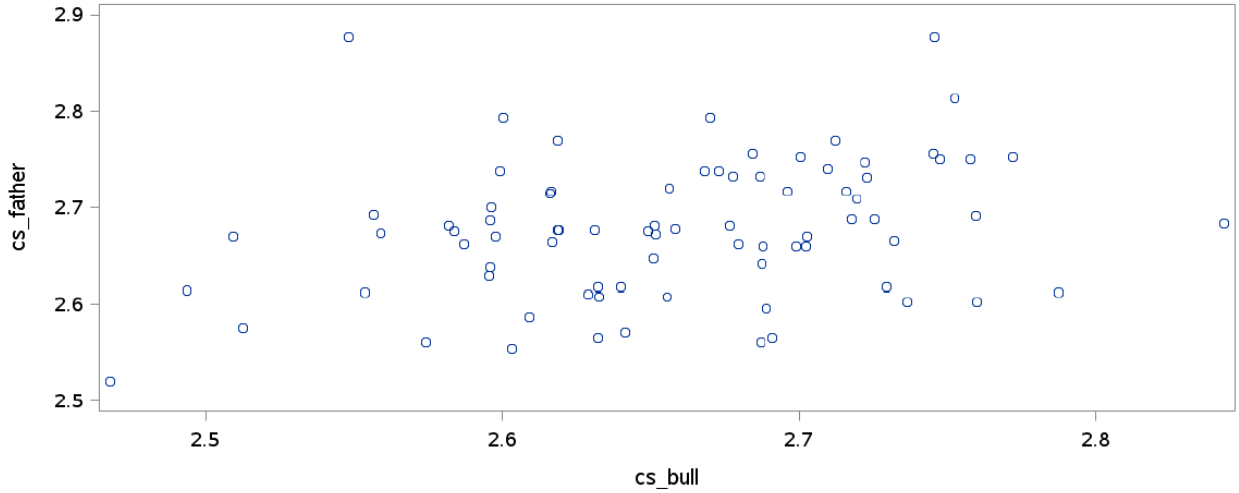
Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	6	1	105	0.39015	0.14471	0.38041	105

RAW MALE, DNK CS2, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	6	1	77	0.46764	0.17685	0.42054	77

RAW FEMALE, DNK CS2, calf_id_nor is HOL, N_calves >500 for bull and sire, bull and sire are status1



Obs	t	land	m1n	b1father	m1R_sq	c500	N500
1	6	1	80	0.29042	0.082896	0.28792	80