

	Pedigree (F_{ped})				Genomic (F_{grm})			
M1: Birth date ¹	β	SE	Z	P	β	SE	Z	P
Intercept	975	138		1.77e-08	949	121		4.85e-10
Sex [male]	-0.04	0.74		0.952	-0.33	0.68		0.631
Maternal age	-10.2	2.58		7.55e-05	-7.16	2.30		0.002
Maternal age ²	11.6	2.44		2.37e-06	8.86	2.16		4.17e-05
Maternal status [Winter]	7.83	1.31		6.82e-13	8.18	1.24		<2e-16
. [Naive]	2.81	1.45		6.82e-13	3.74	1.34		<2e-16
. [Milk]	6.22	0.96		6.82e-13	6.83	0.87		<2e-16
Year (slope)	-0.45	0.07		4.82e-08	-0.44	0.06		5.16e-09
Population size $t - 1$	0.18	0.91		0.844	1.01	0.86		0.252
Inbreeding coefficient	-2.49	13.4		0.852	16.3	10.4		0.118
Maternal Inbreeding coef.	15.0	19.9		0.450	17.9	14.2		0.207
Random:	Var	SE	Z		Var	SE	Z	
Maternal ID	17.30	5.229	3.309		22.57	5.052	4.467	
Birth year	2.878	1.926	1.494		2.956	1.735	1.703	
Spatial region	2.04e-05	8.31e-07	24.53		1.90e-05	7.29e-07	26.03	
Residual	201.5	8.215	24.53		187.6	7.206	26.03	
M2: Birth weight ²	β	SE	Z	P	β	SE	Z	P
Intercept	5.50	0.27		2.51e-07	5.33	0.26		4.96e-07
Age (Hours)	0.65	0.03		<2e-16	0.66	0.02		<2e-16
Sex [male]	0.30	0.05		6.64e-10	0.32	0.04		5.79e-13
Birth date	0.18	0.04		7.39e-07	0.15	0.03		4.65e-06
Maternal age	1.55	0.17		<2e-16	1.64	0.16		<2e-16
Maternal age ²	-1.57	0.17		<2e-16	-1.67	0.15		<2e-16
Maternal status [Winter]	-0.69	0.09		<2e-16	-0.71	0.08		<2e-16
. [Naive]	-0.50	0.09		<2e-16	-0.44	0.09		<2e-16
. [Milk]	-0.59	0.07		<2e-16	-0.56	0.06		<2e-16
Population size $t - 1$	-0.12	0.08		0.143	-0.11	0.06		0.084
Spring temperature	0.19	0.05		8.34e-04	0.18	0.04		6.42e-05
Inbreeding coefficient	-1.29	0.86		0.137	-2.25	0.69		0.001
Maternal Inbreeding coef.	-0.58	2.12		0.785	-1.95	1.46		0.184
Random:	Var	SE	Z		Var	SE	Z	
Maternal ID	0.577	0.059	9.749		0.561	0.054	10.37	
Birth year	0.044	0.017	2.534		0.024	0.011	2.214	
Spatial region	0.098	0.069	1.417		0.107	0.073	1.465	
Residual	0.623	0.028	22.12		0.617	0.026	23.51	
M3: Summer survival ³	β	SE	Z	P	β	SE	Z	P
Intercept	1.60	0.58	2.75	0.006	1.66	0.56	2.98	0.003
Sex [male]	-0.06	0.19	-0.30	0.764	-0.10	0.18	-0.57	0.569
Birth date	-0.25	0.11	-2.28	0.023	-0.23	0.11	-2.20	0.028
Birth weight	0.51	0.10	5.26	1.44e-07	0.49	0.10	4.90	9.54e-07
Maternal age	0.80	0.46	1.75	0.081	0.85	0.43	1.97	0.048
Maternal age ²	-0.82	0.46	-1.78	0.076	-0.89	0.43	-2.09	0.037
Population size $t - 1$	-0.18	0.17	-1.10	0.269	-0.27	0.16	-1.71	0.087
Inbreeding coefficient	1.12	3.11	0.36	0.719	0.11	2.63	0.04	0.967
Maternal Inbreeding coef.	-3.47	4.18	-0.83	0.407	-4.93	3.21	-1.54	0.125
Random:	Var	2.5%	97.5%		Var	2.5%	97.5%	
Maternal ID	0.202	3.51e-15	0.647		0.396	7.68e-13	0.975	
Spatial region	0.076	0.00e+00	0.464		0.044	1.10e-13	0.306	
M4: Winter survival ⁴	β	SE	Z	P	β	SE	Z	P
Intercept	1.65	0.97	1.70	0.090	1.76	0.94	1.86	0.062
Sex [male]	-0.82	0.18	-4.44	8.90e-06	-0.78	0.17	-4.59	4.36e-06
Birth date	-0.72	0.14	-5.23	1.68e-07	-0.60	0.12	-5.07	3.97e-07
Birth weight	0.90	0.12	7.36	1.87e-13	0.81	0.11	7.41	1.26e-13
Maternal age	0.66	0.64	1.05	0.295	0.51	0.59	0.87	0.385
Maternal age ²	-1.04	0.61	-1.72	0.085	-0.93	0.55	-1.69	0.091
Maternal status [Milk]	0.39	0.24	1.62	0.105	0.24	0.22	1.11	0.269
. [Naive]	0.01	0.35	0.04	0.971	-0.20	0.33	-0.59	0.554
. [Winter]	-0.46	0.30	-1.52	0.128	-0.47	0.29	-1.65	0.100
Winter rainfall	-1.07	0.25	-4.23	2.37e-05	-0.90	0.24	-3.81	1.36e-04
Inbreeding coefficient	-17.3	3.55	-4.88	1.09e-06	-12.4	2.53	-4.91	9.20e-07
Maternal Inbreeding coef.	-4.65	4.68	-0.99	0.321	-3.06	3.29	-0.93	0.352
Random:	Var	2.5%	97.5%		Var	2.5%	97.5%	
Maternal ID	0.600	0.233	1.567		0.444	0.107	1.188	
Birth year	1.511	1.108	5.296		1.426	0.986	3.671	
Spatial region	0.995	0.073	3.272		1.176	0.083	3.128	

¹Birth date (days), linear mixed model fitted with ASREML

²Capture weight (kg) of calves caught within 7 days of birth, linear mixed model fitted with ASREML

³Calf summer survival (until October 1). All survival models were fitted as binomial mixed models in LME4.

⁴Calf winter survival (October 1 – May 1)

Table S3: (continued)

	Pedigree (F_{ped})				Genomic (F_{grm})			
M5: Age 1–2 survival ⁵	β	SE	Z	P	β	SE	Z	P
Intercept	2.95	0.58	5.08	3.82e-07	3.42	0.69	4.96	7.02e-07
Sex [male]	-0.73	0.22	-3.32	9.02e-04	-0.93	0.23	-4.11	3.89e-05
Birth date	-0.34	0.17	-2.03	0.043	-0.52	0.16	-3.25	0.001
Birth weight	0.51	0.13	3.84	1.25e-04	0.43	0.13	3.29	0.001
Maternal age	-0.23	0.15	-1.54	0.123	-0.33	0.15	-2.25	0.025
Maternal status [Milk]	0.10	0.27	0.38	0.706	0.15	0.27	0.55	0.579
. [Naive]	-2.4e-03	0.38	-6.3e-03	0.995	-0.25	0.39	-0.64	0.521
. [Winter]	-4.9e-04	0.39	-1.3e-03	0.999	-0.05	0.38	-0.12	0.907
Inbreeding coefficient	-9.82	4.94	-1.99	0.047	-12.3	3.60	-3.41	6.56e-04
Maternal Inbreeding coef.	-5.56	5.39	-1.03	0.302	-7.99	4.24	-1.88	0.060
Random:	Var	2.5%	97.5%		Var	2.5%	97.5%	
Maternal ID	0.069	3.13e-07	0.646		0.164	3.64e-07	1.628	
Birth year	0.690	0.158	1.689		0.862	0.158	1.794	
Spatial region	0.406	3.07e-05	0.726		1.206	0.027	5.348	
M6: Age 0–2 survival ⁶	β	2.5%	97.5%	P	β	2.5%	97.5%	P
Intercept	3.64	1.21	5.97	0.004	3.00	0.51	5.43	0.023
Sex [male]	-0.61	-0.93	-0.31	<4e-04	-0.67	-0.96	-0.38	<4e-04
Maternal age	0.43	0.11	0.77	0.010	0.54	0.25	0.86	8.00e-04
Maternal age ²	-0.03	-0.05	-0.01	0.002	-0.04	-0.05	-0.02	<4e-04
Maternal status [Milk]	-0.10	-0.51	0.28	0.617	-0.28	-0.66	0.10	0.158
. [Naive]	-0.50	-1.10	0.08	0.098	-0.53	-1.12	0.02	0.058
. [Winter]	-0.95	-1.50	-0.43	<4e-04	-0.79	-1.32	-0.28	0.002
Winter rainfall	-3.7e-03	-5.6e-03	-2.1e-03	<4e-04	-3.5e-03	-5.2e-03	-1.6e-03	0.002
Inbreeding coefficient	-13.4	-20.2	-7.42	<4e-04	-13.5	-18.1	-8.64	<4e-04
Maternal inbreeding coef.	-5.02	-13.6	3.69	0.261	-8.71	-15.2	-2.22	0.006
Random:	Var	2.5%	97.5%		Var	2.5%	97.5%	
Birth year	0.531	0.155	0.973		0.634	0.251	1.121	
Maternal ID	0.968	0.401	1.618		1.093	0.520	1.729	
Spatial region	1.361	0.172	3.371		1.893	0.258	4.850	
M7: Female AFR ⁷	β	2.5%	97.5%	P	β	2.5%	97.5%	P
Intercept	-0.07	-0.43	0.25	0.673	-0.10	-0.40	0.20	0.453
Birth weight	-0.05	-0.18	0.06	0.405	-0.08	-0.20	0.03	0.187
Population size	0.24	0.06	0.44	0.010	0.24	0.06	0.41	0.002
Inbreeding coefficient	1.96	-5.46	8.25	0.556	2.14	-1.48	6.36	0.276
Maternal inbreeding coef.	-0.56	-6.29	4.20	0.857	-3.46	-7.24	0.77	0.087
Random:	Var	2.5%	97.5%		Var	2.5%	97.5%	
Spatial region	0.129	3.64e-04	0.409		0.120	4.48e-04	0.340	
M8: Female annual survival ⁸	β	2.5%	97.5%	P	β	2.5%	97.5%	P
Intercept	7.47	4.40	10.8	<4e-04	6.85	3.33	10.2	<4e-04
Age	0.30	0.06	0.51	0.005	0.32	0.11	0.53	0.005
Age ²	-0.03	-0.04	-0.02	<4e-04	-0.03	-0.04	-0.02	<4e-04
has/had calf in year t	-1.42	-1.85	-0.97	<4e-04	-1.67	-2.15	-1.24	<4e-04
Population size	-0.02	-0.03	7.4e-04	0.063	-0.01	-0.03	4.7e-03	0.167
Inbreeding coefficient	-2.07	-10.7	8.39	0.653	-6.84	-13.8	-0.43	0.053
Random:	Var	2.5%	97.5%		Var	2.5%	97.5%	
Observation year	0.211	3.18e-05	0.559		0.293	1.61e-04	0.637	
Birth year	0.026	5.08e-05	0.113		0.029	5.78e-05	0.124	
Maternal ID	0.478	5.28e-05	1.184		0.392	8.04e-05	1.181	
Spatial region	0.088	7.24e-05	0.347		0.255	1.31e-04	0.840	
M9: Male annual survival ⁹	β	2.5%	97.5%	P	β	2.5%	97.5%	P
Intercept	4.48	3.41	5.77	<4e-04	4.61	3.50	5.72	<4e-04
Age	0.31	-0.01	0.62	0.055	0.32	6.1e-03	0.60	0.041
Age ²	-0.05	-0.07	-0.03	<4e-04	-0.05	-0.07	-0.03	<4e-04
Immigrant					0.03	-0.62	0.73	0.922
Inbreeding coefficient	-8.41	-17.3	0.87	0.081	-1.19	-8.44	6.06	0.739
Random:	Var	2.5%	97.5%		Var	2.5%	97.5%	
Observation year	0.295	6.11e-05	0.881		0.397	3.57e-04	0.881	
Birth year	0.427	7.17e-05	1.068		0.521	5.65e-05	1.138	
Maternal ID	0.199	5.03e-05	0.936		0.239	4.09e-05	1.054	

⁵Yearling survival (age 1–2 years, May 1 – May 1)⁶Juvenile survival (age 0–2 years), binomial model with logit link fitted in MCMCglmm (model converged poorly in LME4 when birthweight was not accounted for), 600k (thousand) iterations, 100k burn-in and thinning of 200.⁷Female age at first reproduction, quasi-Poisson model in MCMCglmm, 40m (million) iterations, 500k burn-in and thinning of 20k. The random effect for maternal ID was estimated at 0, and dropped.⁸Female annual survival (age 2+), binomial model in MCMCglmm, 2m iterations, 500k burn-in and thinning of 500.⁹Male annual survival (age 2+). Male annual survival (age 2+), binomial model in MCMCglmm, 2m iterations, 500k burn-in and thinning of 500. F_{ped} could not be estimated for any immigrant male.

Table S3: (continued)

	Pedigree (F_{ped})				Genomic (F_{grm})			
	β	2.5%	97.5%	P	β	2.5%	97.5%	P
M10: Female ABS ¹⁰								
Intercept	4.68	0.49	8.67	0.026	4.76	0.64	8.65	0.022
Age	0.79	0.56	1.04	<4e-04	0.79	0.57	1.04	<4e-04
Age ²	-0.04	-0.06	-0.03	<4e-04	-0.04	-0.06	-0.03	<4e-04
had calf on Oct 1 of $t - 1$	-3.12	-3.46	-2.75	<4e-04	-3.19	-3.56	-2.82	<4e-04
Age first reprod. [early]	0.84	0.33	1.39	<4e-04	0.81	0.28	1.33	0.002
Age first reprod. [late]	-0.85	-1.26	-0.46	<4e-04	-0.73	-1.13	-0.33	<4e-04
Population size $t - 1$	-0.03	-0.05	-3.1e-03	0.020	-0.03	-0.05	-5.2e-03	0.017
Inbreeding coefficient	-6.24	-14.8	2.21	0.154	-8.35	-14.9	-2.37	0.008
Random:	Var	2.5%	97.5%		Var	2.5%	97.5%	
Individual ID	0.659	0.195	1.175		0.633	0.187	1.176	
Observation year	0.714	0.236	1.352		0.760	0.272	1.415	
Birth year	0.014	4.65e-05	0.060		0.013	5.05e-05	0.054	
Maternal ID	0.151	7.22e-05	0.484		0.176	6.04e-05	0.475	
Spatial region	0.218	1.66e-04	0.680		0.173	5.96e-05	0.518	
M11: Male ABS ¹¹								
Intercept	-10.1	-12.7	-7.48	<6e-04	-12.5	-15.0	-10.2	<6e-04
Age	2.00	1.73	2.30	<6e-04	2.25	2.01	2.51	<6e-04
Age ²	-0.10	-0.11	-0.08	<6e-04	-0.11	-0.12	-0.10	<6e-04
Population size $t - 1$	-3.7e-03	-0.02	9.1e-03	0.552	2.4e-03	-7.5e-03	0.01	0.650
Immigrant					0.72	0.23	1.25	0.006
Inbreeding coefficient	-11.9	-27.4	1.19	0.082	-13.0	-19.9	-6.55	<6e-04
Random:	Var	2.5%	97.5%		Var	2.5%	97.5%	
Individual ID	1.065	0.645	1.551		0.938	0.566	1.337	
Observation year	0.194	0.088	0.325		0.166	0.076	0.273	
Birth year	0.302	0.116	0.556		0.235	0.093	0.408	
Maternal ID	0.371	0.140	0.673		0.352	0.127	0.594	
M12: Female LBS ¹²								
Intercept (hurdle)	-6.3e-03	-0.68	0.63	0.986	0.17	-0.67	1.00	0.635
Intercept (Poisson)	1.78	1.61	1.93	<6e-04	1.64	1.23	2.04	<6e-04
Inbreeding (hurdle)	13.7	1.31	25.2	0.018	16.8	7.91	25.8	<6e-04
Inbreeding (Poisson)	-0.08	-3.66	3.65	0.980	-2.12	-4.79	0.80	0.129
Random:	Var	2.5%	97.5%		Var	2.5%	97.5%	
BirthYear (hurdle)	1.239	0.237	2.577		1.256	0.243	2.622	
BirthYear (Poisson)	0.005	2.14e-04	0.016		0.006	1.89e-04	0.019	
Maternal ID (hurdle)	0.551	3.42e-04	1.682		0.391	3.13e-04	1.382	
Maternal ID (Poisson)	0.023	2.30e-04	0.070		0.030	3.08e-04	0.090	
Spatial region (hurdle)	0.164	3.26e-04	0.623		0.498	3.11e-04	1.569	
Spatial region (Poisson)	0.024	2.79e-04	0.085		0.224	2.71e-04	0.783	
M13: Female LRS ¹³								
Intercept (hurdle)	0.47	-0.28	1.25	0.189	0.68	-0.34	1.67	0.151
Intercept (Poisson)	1.22	0.98	1.48	<6e-04	0.97	0.37	1.50	0.011
Inbreeding (hurdle)	14.2	1.04	27.3	0.029	18.7	8.41	30.2	8.08e-04
Inbreeding (Poisson)	-9.59	-17.3	-2.70	0.003	-4.13	-8.08	0.13	0.048
Random:	Var	2.5%	97.5%		Var	2.5%	97.5%	
BirthYear (hurdle)	0.985	0.048	2.309		0.965	0.039	2.240	
BirthYear (Poisson)	0.028	1.91e-04	0.087		0.015	1.84e-04	0.053	
Maternal ID (hurdle)	1.071	3.36e-04	2.890		0.923	3.86e-04	2.749	
Maternal ID (Poisson)	0.027	2.40e-04	0.095		0.025	1.97e-04	0.091	
Spatial region (hurdle)	0.302	2.89e-04	1.215		0.956	4.99e-04	3.157	
Spatial region (Poisson)	0.057	2.26e-04	0.175		0.394	0.001	1.377	
M14: Male LBS ¹⁴								
Intercept (hurdle)	1.61	1.01	2.23	<6e-04	2.00	1.45	2.68	<6e-04
Intercept (Poisson)	1.90	1.58	2.18	<6e-04	1.53	1.25	1.84	<6e-04
Immigrant (hurdle)					-4.11	-5.77	-2.75	<6e-04
Immigrant (Poisson)					0.37	-0.14	0.89	0.163
Inbreeding (hurdle)	31.7	9.89	54.6	<6e-04	18.6	7.81	28.3	0.001
Inbreeding (Poisson)	-23.3	-50.2	0.14	0.057	-14.9	-22.8	-7.92	<6e-04
Random:	Var	2.5%	97.5%		Var	2.5%	97.5%	
BirthYear (hurdle)	1.239	0.142	2.745		0.955	0.012	2.091	
BirthYear (Poisson)	0.129	2.43e-04	0.404		0.027	1.77e-04	0.111	
Maternal ID (hurdle)	0.268	2.40e-04	1.226		0.300	2.87e-04	1.412	
Maternal ID (Poisson)	0.267	2.87e-04	0.832		0.205	2.58e-04	0.728	

¹⁰Female annual breeding success (age 5+), binomial mixed model in MCMCglmm October 1 is in the autumn rut (mating season). 600,000 iterations, 100,000 burn-in and thinning of 200.

¹¹Male ABS (age 5+), quasi-Poisson model fitted with MCMCglmm, 1m iterations, 100k burn-in and thinning of 500.

¹²Lifetime breeding success (females), hurdle Poisson model fitted with MCMCglmm, 10m iterations, 200k burn-in and thinning of 5k. '(hurdle)' denotes parameters affecting the probability for LBS to be zero, and '(Poisson)' those affecting the truncated Poisson distribution (LBS greater than zero).

¹³Lifetime reproductive success (females) (no. of surviving offspring), hurdle Poisson model fitted with MCMCglmm, 40m iterations, 500k burn-in and thinning of 2k for F_{grm} , and 2m iterations, 200k burn-in and thinning of 1k for F_{ped} .

¹⁴Lifetime breeding success (males), hurdle Poisson model fitted with MCMCglmm, 1m iterations, 100k burn-in and thinning of 500. The effect of immigrant status on the hurdle is due to observation bias, as no young males immigrated.