

Age-dependent prevalence of anti-*Brucella* antibodies in hooded seals *Cystophora cristata*

Ingebjørg H. Nymo^{1,*,**}, Morten Tryland^{1,**}, Anne Kirstine Frie^{2,**}, Tore Haug^{2,**},
Geoffrey Foster³, Rolf Rødven^{4,**}, Jacques Godfroid^{1,**}

¹Section of Arctic Veterinary Medicine, Norwegian School of Veterinary Science, Stakkevollveien 23,
9010 Tromsø, Norway

²Institute of Marine Research, PO Box 6404, 9294 Tromsø, Norway

³SAC Consulting Veterinary Services, Drummondhill, Stratherrick Road, Inverness IV2 4JZ, UK

⁴Bioforsk – Norwegian Institute of Agricultural and Environmental Research, PO Box 2284, 9269 Tromsø, Norway

*Email: ingebjorg.nymo@nvh.no

**Member of the Fram Centre - High North Research Centre for Climate and the Environment, 9296 Tromsø, Norway

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Supplement. Additional information

Table S1. *Cystophora cristata*. Summary of serum samples from hooded seals from the Northeast Atlantic population where age is estimated in years by counting cementum layers in incisors. Females given in normal type, males in italics

Year	0	1	2	3	4	5	6	7	9	10	11	12	13	14	16	18
1999	4/4															
2004	4/3															
2008																
2009	69/73	6/5														
2010		6	12	17	15	8	4	6	3	2	2	1	1	1	1	2

Table S2. *Cystophora cristata*. Model selection, influence of age group (pups vs. adults), blubber thickness (Backfat) and sex on seroprevalence. Int: intercept; fct(Age-grp): age group set as factor; logLik: likelihood of the model; AIC_c: Akaike's information criterion corrected for small sample size

Int	fct(Age_grp)	Backfat	Sex	fct(Age_grp): Backfat	fct(Age_grp): Sex	df	logLik	AIC _c	ΔAIC _c
-3.5970	+					2	-135.305	274.6	0.00
-2.6970	+	-0.02301				3	-134.808	275.7	1.04
-3.1680	+		-0.29590			3	-134.842	275.8	1.11
-6.2290	+	0.06448			+	4	-134.125	276.4	1.72
-2.2950	+	-0.02251	-0.28930			4	-134.367	276.8	2.20
-5.7410	+	0.06240	-0.27820		+	5	-133.720	277.6	2.97
-3.6790	+	0.05481			+	4	-134.777	277.7	3.02
-2.7730	+	-0.02226	0.03105		+	5	-134.313	278.8	4.15
-6.4630	+	0.06550	0.12830		+	6	-133.633	279.5	4.86
0.8189		-0.08589				2	-142.886	289.8	15.16
1.1540		-0.08655	-0.20520			3	-142.656	291.4	16.74
-1.6510						1	-156.239	314.5	39.84
-1.5110		-0.09055				2	-156.190	316.4	41.77

Table S3. *Cystophora cristata*. Model selection: influence of age (exact age), blubber thickness (Backfat) and sex on seroprevalence. Other abbreviations as in Table S2

Int	Age	Backfat	Sex	Age:Backfat	df	logLik	AIC _c	ΔAIC _c
3.0000	-0.7354	-0.08921			3	-35.194	76.7	0.00
1.6260	-0.7553	-0.07827	0.60180		4	-35.091	78.6	1.98
1.6260	-0.7553	-0.07827	0.60180		4	-35.091	78.6	1.98
2.7370	-0.5878	-0.07892		-0.006188	4	-35.181	78.8	2.16
0.4237	-0.5891				2	-37.356	78.8	2.18
-2.1900	-0.6856		1.48900		3	-36.450	79.2	2.51
-2.1900	-0.6856		1.48900		3	-36.450	79.2	2.51
0.9402	-0.4890	-0.05802	0.69260	-0.011250	5	-35.050	80.8	4.14
0.9402	-0.4890	-0.05802	0.69260	-0.011250	5	-35.050	80.8	4.14
0.1852		-0.06455			2	-44.225	92.6	15.92
-1.4140					1	-45.477	93.0	16.34
2.5300		-0.07935	-1.01800		3	-43.960	94.2	17.53
-1.3570			-0.02899		2	-45.477	95.1	18.43

Table S4. *Cystophora cristata*. Model selection: influence of year, sex and seroprevalence (Seropr) on body weight of pups. Other abbreviations as in Table S2

Int	Seropr	Sex	Year	df	logLik	AIC _c	ΔAIC _c
1507.00			-0.7357	3	-464.607	935.4	0.00
1431.00	3.202		-0.6979	4	-464.272	936.8	1.44
1510.00		-0.6562	-0.7366	4	-464.325	936.9	1.55
1434.00	3.207	-0.6574	-0.6987	5	-463.988	938.4	3.02
29.64	6.361			3	-470.146	946.5	11.08
29.72				2	-471.427	946.9	11.56
30.59	6.370	-0.6397		4	-469.897	948.1	12.69
30.67		-0.6352		3	-471.186	948.5	13.16

Table S5. *Cystophora cristata*. Model selection: influence of year, sex and seroprevalence (Seropr) on body length of pups. Other abbreviations as in Table S2

Int	Seropr	Sex	Year	df	logLik	AIC _c	ΔAIC _c
894.3			-0.3944	3	-471.852	949.9	0.00
102.3				2	-473.692	951.5	1.60
896.3		-0.4507	-0.3950	4	-471.732	951.7	1.87
882.4	0.5052		-0.3884	4	-471.845	952.0	2.10
102.2	2.2640			3	-473.536	953.2	3.37
102.9		-0.4394		3	-473.581	953.3	3.46
884.2	0.5086	-0.4509	-0.3890	5	-471.724	953.9	4.00
102.9	2.2690	-0.4410		4	-473.423	955.1	5.25

Table S6. *Cystophora cristata*. Model selection: influence of year, sex and seroprevalence (Seropr) on dorsal blubber of pups. Other abbreviations as in Table S2

Int	Seropr	Sex	Year	df	logLik	AIC _c	ΔAIC _c
39.56				2	-491.082	986.2	0.00
39.48	5.870			3	-490.245	986.7	0.41
41.07		-1.020		3	-490.603	987.4	1.12
41.00	5.884	-1.024		4	-489.757	987.8	1.54
311.00			-0.13520	3	-490.913	988.0	1.74
179.30	5.555		-0.06963	4	-490.202	988.7	2.43
315.40		-1.024	-0.13660	4	-490.429	989.1	2.89
183.60	5.563	-1.026	-0.07099	5	-489.712	989.8	3.59

Table S7. *Cystophora cristata*. Model selection: influence of year, sex and seroprevalence (Seropr) on dorsal blubber of yearlings. Other abbreviations as in Table S2

Int	Seropr	Sex	Year	df	logLik	AIC _c	ΔAIC _c
23080.00			-11.47	3	-53.938	115.7	0.00
22160.00	+		-11.01	4	-53.712	118.8	3.03
21470.00		-1.767	-10.67	4	-53.810	119.0	3.23
20840.00	+	-1.518	-10.36	5	-53.616	122.7	6.96
43.70		-7.100		3	-57.862	123.6	7.85
31.59				2	-59.395	123.6	7.92
33.18	+			3	-58.747	125.3	9.62
43.65	+	-6.395		4	-57.482	126.3	10.57

Table S8. *Cystophora cristata*. Model selection: influence of year, sex and seroprevalence (Seropr) on body length of yearlings. Other abbreviations as in Table S2. As possible model combinations are often large (>25), and models with a ΔAIC_c >4 are less likely to represent the data (Burnham & Anderson 2002), models with a ΔAIC_c >10 are omitted from the table

Int	Seropr	Sex	Year	Seropr: Sex	Seropr: Year	Seropr: Sex:Year	df	logLik	AIC _c	ΔAIC _c
-34460.0			17.21				3	-53.456	114.8	0.00
-33020.0	+		16.49				4	-52.852	117.0	2.28
-32030.0		2.667	16.00				4	-53.143	117.6	2.86
-39230.0	+		19.58	+			5	-51.934	119.3	4.56
-31050.0	+	2.275	15.51				5	-52.611	120.7	5.92
-37350.0	+	1.875	18.65		+		6	-51.754	123.9	9.15
-31600.0	+	3.985	15.78	+			6	-51.981	124.4	9.60
-36220.0	+	3.000	18.08	+	+		7	-51.555	129.6	14.80

(rest of table omitted)

Table S9. *Cystophora cristata*. Model selection: influence of year, sex and seroprevalence (Seropr) on body weight of yearlings. Other abbreviations as in Table S2. As possible model combinations are often large (>25), and models with a ΔAIC_c >4 are less likely to represent the data (Burnham & Anderson 2002), models with a ΔAIC_c >10 are omitted from the table

Int	Seropr	Sex	Year	Seropr: Sex	Seropr: Year	Seropr: Sex:Year	df	logLik	AIC _c	ΔAIC _c
-35730.00			17.80				3	-60.343	128.5	0.00
-32580.00	+		16.23				4	-59.007	129.3	0.81
-33780.00		2.133	16.83				4	-60.255	131.8	3.31
-29680.00	+		14.79		+		5	-58.915	133.3	4.75
-31510.00	+	1.229	15.70				5	-58.973	133.4	4.87
40.91	+						3	-64.649	137.1	8.61
26.65		10.550					3	-64.828	137.5	8.97
44.65							2	-66.323	137.5	8.97
-28240.00	+	1.438	14.07		+		6	-58.868	138.1	9.60
-31560.00	+	1.368	15.73	+			6	-58.972	138.3	9.81
26.80	+	8.623					4	-63.508	138.3	9.82
27.64	+	8.107		+			5	-63.495	142.4	13.91
-27420.00	+	2.250	13.67	+		+	7	-58.824	144.1	15.56

(rest of table omitted)

Table S10. *Cytophora cristata*. Model selection: influence of age (exact age), blubber thickness (Backfat) and seroprevalence (Seropr) on the presence of corpora albicantia. Other abbreviations as in Table S2. As possible model combinations are often large (>25), and models with a $\Delta AIC_c > 4$ are less likely to represent the data (Burnham & Anderson 2002), models with a $\Delta AIC_c > 10$ are omitted from the table

Int	Age	Seropr	Backfat	Age: Seropr	Age: Backfat	Seropr: Backfat	Age:Seropr: Backfat	df	logLik	AIC _c	ΔAIC_c
-6.2350	4.961		-0.7489					3	-5.721	18.5	0.00
-1728.00	433.1		71.3400		-17.92			4	-4.494	18.8	0.32
-6.0060	4.965	+	-0.7572					4	-5.701	21.2	2.73
-1796.00	450.3	+	74.2000		-18.64			5	-4.307	21.5	2.99
-4.7030	4.360	+	-0.6902	+				5	-5.336	23.5	5.04
-4.7030	4.360	+	-0.6902	+		+		5	-5.336	23.5	5.04
-4.7030	4.360	+	-0.6902			+		5	-5.336	23.5	5.04
-1730.00	433.9	+	71.4600	+	-17.95			6	-4.307	24.8	6.33
-1730.00	433.9	+	71.4600	+	-17.95	+		6	-4.307	24.8	6.33
-1730.00	433.9	+	71.4600	+	-17.95	+	+	6	-4.307	24.8	6.33
-1730.00	433.9	+	71.4600		-17.95	+		6	-4.307	24.8	6.33
-10.61	2.112							2	-11.935	28.4	9.88

(rest of table omitted)

Table S11. *Cytophora cristata*. Model selection: influence of age (exact age), blubber thickness (Backfat) and seroprevalence (Seropr) on the presence of corpora lutea. Other abbreviations as in Table S2

Int	Age	Seropr	Backfat	Age: Seropr	Seropr: Backfat	Age: Backfat	df	logLik	AIC _c	ΔAIC_c
-4.82	1.53						2	-24.49	53.3	0
-5.33	1.39		0.04				3	-24.37	55.3	2.06
-4.49	1.17					0.01	3	-24.38	55.4	2.09
-4.54	1.46	+					3	-24.42	55.4	2.17
-6.65	1.55	+	0.08	+			5	-21.97	55.5	2.25
-6.65	1.55	+	0.08		+		5	-21.97	55.4	2.25
-5.06	1.33	+	0.04				4	-24.31	57.6	4.36
-4.25	1.23	+				0.01	4	-24.32	57.7	4.39
-4.35	1.16			+		0.01	4	-24.32	57.7	4.42
-3.44			0.15				2	-27.91	60.1	6.84
-4.13	1.07	+		+		0.01	5	-24.31	60.2	6.93
-3.83		+	0.17	+			4	-25.68	60.4	7.12
-3.84		+	0.17		+		4	-25.68	60.7	7.12
-2.86		+	0.13				3	-27.31	61.2	7.95
0.18		+					2	-29.18	62.7	9.38
-0.09							1	-30.45	63	9.73

Table S12. *Cytophora cristata*. Model selection: influence of age (exact age), blubber thickness (Backfat) and seroprevalence (Seropr) on the number of corpora albicantia. Other abbreviations as in Table S2

Int	Age	Seropr	Backfat	Age: Seropr	Age: Backfat	Seropr: Backfat	df	logLik	AIC _c	ΔAIC_c
-2.865	0.8003		-0.09072				3	-14.681	36.4	0.00
-6.019	1.0040						2	-15.973	36.4	0.04
2.175			-0.13960				2	-16.361	37.2	0.82
8.015	-1.1230		0.08809				4	-14.222	38.3	1.86
-6.340	1.0540	+					3	-15.762	38.6	2.16
-3.205	0.8466	+	-0.08825				4	-14.589	39.0	2.59
2.165		+	-0.13940				3	-16.359	39.8	3.36
-1.099							1	-18.888	39.9	3.53
-6.069	1.0020	+		+			4	-15.457	40.7	4.33
2.273		+	-0.14440			+	4	-15.514	40.8	4.44
-2.621	0.7626	+	-0.09484	+			5	-14.159	41.2	4.77
-2.621	0.7626	+	-0.09484	+			5	-14.159	41.2	4.77
-2.621	0.7626	+	-0.09484			+	5	-14.159	41.2	4.77
7.390	-1.0200	+	-0.56440		0.08462		5	-14.188	41.2	4.83
-1.139		+					2	-18.809	42.1	5.71
9.535	-1.3820	+	-0.64390		0.09768	+	6	-13.644	43.5	7.08
9.535	-1.3820	+	-0.64390	+	0.09768		6	-13.644	43.5	7.08
9.535	-1.3820	+	-0.64390	+	0.09768	+	6	-13.644	43.5	7.08

LITERATURE CITED

Burnham KP, Anderson DR (2002) Model selection and inference: a practical information-theoretic approach, 2nd edn. Springer, New York, NY