

Table S1. Parameter estimates, likelihood ratios (LRT), and *P*-values (single term deletions) for models of the responses to an immune challenge (1 mg kg⁻¹ intramuscular LPS) in Svalbard ptarmigan that were studied in winter and spring in each of two ambient temperatures (T_a ; 0°C and -20°C). The Season \times T_a interaction was removed from the models when non-significant, but all other terms were retained. Significances of main effects were not assessed in the presence of interactions. Different letters within brackets denote significant differences. Abbreviations: RMR: Resting metabolic rate; C: Thermal conductance; T_c : Core body temperature; T_{back} : Back skin temperature; T_{head} : Head skin temperature; BKA: Bacteria killing ability. *P*-values < 0.05 are printed in bold. * *P* = 0.052.

Parameter	Estimate (SE)	LRT	<i>P</i>
Change in RMR (W)			
Season (Winter or Spring)		11.13	< 0.001
Season = Winter [A]	-0.26 (0.14)		
Season = Spring [B]	0.50 (0.18)		
T_a (-20°C or 0°C)		2.02	0.155
Season \times T_a		0.15	0.693
Change in C (W °C⁻¹)			
Season (Winter or Spring)		10.38	0.001
Season = Winter [A]	-0.004 (0.003)		
Season = Spring [B]	0.012 (0.004)		
T_a (-20°C or 0°C)		1.31	0.252
Season \times T_a		0.61	0.433
Change in T_c (°C)			
Season (Winter or Spring)		2.23	0.136
T_a (-20°C or 0°C)		0.41	0.520
Season \times T_a		2.11	0.146
Change in T_{back} (°C)			
Season (Winter or Spring)		5.81	0.016
Season = Winter [A]	-0.92 (0.32)		
Season = Spring [B]	-0.19 (0.27)		
T_a (-20°C or 0°C)		0.06	0.805
Season \times T_a		0.33	0.567
Change in T_{head} (°C)			
Season (Winter or Spring)		2.53	0.112
T_a (-20°C or 0°C)		0.91	0.341
Season \times T_a		0.10	0.751
Change in lysis (titer)			
Season (Winter or Spring)			
T_a (-20°C or 0°C)			
Season \times T_a		10.39	0.001
Season = Winter			
T_a = -20°C [A]	-1.30 (0.19)		
T_a = 0°C [B]	-0.55 (0.14)		
Season = Spring			
T_a = -20°C [B*]	-0.21 (0.22)		
T_a = 0°C [B]	-0.60 (0.17)		
Change in agglutination (titer)			
Season (Winter or Spring)		0.36	0.547
T_a (-20°C or 0°C)		5.07	0.024
T_a = -20°C [A]	-1.67 (1.03)		
T_a = 0°C [B]	1.03 (0.76)		
Season \times T_a		0.95	0.330
Change in BKA (%)			
Season (Winter or Spring)		0.08	0.780
T_a (-20°C or 0°C)		0.25	0.620
Season \times T_a		1.43	0.232

Change in haptoglobin (mg ml⁻¹)			
Season (Winter or Spring)		0.12	0.733
T_a (-20°C or 0°C)		0.75	0.385
Season $\times T_a$		0.03	0.857
Duration of anorexia (d)			
Season (Winter or Spring)		0.01	0.937
T_a (0°C or -20°C)		0.34	0.562
Season $\times T_a$		3.31	0.069
Magnitude of anorexia (M_a)			
Season (Winter or Spring)		1.20	0.274
T_a (0°C or -20°C)		5.11	0.024
$T_a = -20^\circ\text{C}$ [A]	0.34 (0.06)		
$T_a = 0^\circ\text{C}$ [B]	0.48 (0.05)		
Season $\times T_a$		0.77	0.380
Body mass loss (g)			
Season (Winter or Spring)		1.98	0.159
T_a (0°C or -20°C)		1.96	0.161
Season $\times T_a$		1.75	0.186
Body mass loss (proportion of baseline)			
Season (Winter or Spring)		4.26	0.039
Season = Winter [A]	0.07 (0.02)		
Season = Spring [B]	0.12 (0.02)		
T_a (0°C or -20°C)		1.40	0.237
Season $\times T_a$		0.49	0.484
Loss of fasting resistance (d)			
Season (Winter or Spring)		2.15	0.142
T_a (0°C or -20°C)		2.20	0.138
Season $\times T_a$		1.69	0.194
Loss of fasting resistance (proportion of baseline)			
Season (Winter or Spring)		13.25	< 0.001
Season = Winter [A]	0.17 (0.04)		
Season = Spring [B]	0.38 (0.05)		
T_a (0°C or -20°C)		0.13	0.721
Season $\times T_a$		1.82	0.178