

Supplementary material

Table S1. Acid-base physiology¹ of Antarctic krill at various levels of experimental temperature (°C) and pH with exposure periods from 1 to 48 h. Ambient temperature and pH conditions are 0°C, pH = 8.1. Values are means ± SD. Replicate unit is individual or pooled sample with n values in parentheses. – = not measured.

Temp (T)	pH (P)	Time (Tm)	Tissue TCO ₂	Tissue pH	Tissue lactate	Blood pH	Blood lactate
0	8.1	1	7.09 ± 1.64 (5) a	7.17 ± 0.07 (9)	0.00 ± 0.00 (4)	8.11 ± 0.16 (2)	4.45 ± 0.07 (2)
0	7.7	1	18.84 ± 3.94 (5) b	7.17 ± 0.04 (10)	1.00 ± 2.24 (5)	8.11 ± 0.16 (2)	4.35 ± 0.07 (2)
3	8.1	1	8.68 ± 2.24 (4) a	7.20 ± 0.05 (9)	0.00 ± 0.00 (5)	8.17 ± 0.07 (2)	4.50 ± 1.70 (2)
3	7.7	1	8.45 ± 1.71 (5) a	7.19 ± 0.03 (10)	0.00 ± 0.00 (5)	8.17 ± 0.05 (2)	4.00 ± 0.71 (2)
		<i>Pr > F²</i>	0.0023	0.3433	0.2742	0.7809	0.9101
0	8.1	6	9.67 ± 0.91 (5)	7.25 ± 0.07 (10)	1.60 ± 1.82 (5)	8.15 ± 0.12 (2)	4.15 ± 0.21 (2)
0	7.7	6	10.85 ± 1.89 (5)	7.26 ± 0.05 (10)	0.20 ± 0.45 (5)	8.19 ± 0.03 (2)	4.50 ± 0.57 (2)
3	8.1	6	7.12 ± 1.47 (5)	7.19 ± 0.03 (10) a	0.00 ± 0.00 (4)	8.19 ± 0.06 (2)	4.30 ± 1.13 (2)
3	7.7	6	9.78 ± 3.06 (5)	7.30 ± 0.08 (10) b	0.00 ± 0.00 (5)	8.21 ± 0.04 (2)	4.55 ± 0.78 (2)
		<i>Pr > F²</i>	0.3362	0.0026	0.0392	0.9157	0.9446
0	8.1	12	17.29 ± 4.43 (5)	7.27 ± 0.05 (5)	0.00 ± 0.00 (5)	–	–
0	7.7	12	10.15 ± 1.78 (5)	7.21 ± 0.02 (5)	0.20 ± 0.45 (5)	–	–
3	8.1	12	15.68 ± 1.88 (5)	7.14 ± 0.03 (5) a	0.00 ± 0.00 (5)	–	–
3	7.7	12	13.37 ± 3.59 (5)	7.28 ± 0.02 (5) b	0.00 ± 0.00 (5)	–	–
		<i>Pr > F²</i>	0.2292	0.0060	1.0000	–	–
0	8.1	24	9.67 ± 4.42 (5)	7.19 ± 0.05 (10)	0.00 ± 0.00 (3)	8.19 ± 0.08 (2)	3.10 ± 0.14 (2)
0	7.7	24	11.52 ± 1.84 (5)	7.22 ± 0.01 (5)	0.00 ± 0.00 (5)	8.19 ± 0.07 (2)	3.30 ± 0.28 (2)
3	8.1	24	9.32 ± 2.28 (5)	7.21 ± 0.05 (10)	0.20 ± 0.45 (5)	8.19 ± 0.05 (2)	2.20 ± 0.28 (2)
3	7.7	24	9.94 ± 1.88 (5)	7.19 ± 0.05 (10)	0.00 ± 0.00 (5)	8.21 ± 0.03 (2)	2.45 ± 0.35 (2)
		<i>Pr > F²</i>	0.7248	0.7117	1.0000	0.6971	0.1022
0	8.1	48	6.41 ± 3.08 (5)	7.22 ± 0.04 (5)	--	--	--

0	7.7	48	8.57 ± 1.26 (5)	7.20 ± 0.02 (5)	--	--	--
3	8.1	48	8.25 ± 1.66 (5)	7.22 ± 0.01 (5)	--	--	--
3	7.7	48	10.65 ± 4.53 (5)	7.23 ± 0.03 (5)	--	--	--
		<i>Pr</i> > F ²	0.2104	0.7480	--	--	--

Main effect means³

0			11.00	7.21	0.38	8.16	3.98
3			10.12	7.21	0.03	8.19	3.67
	8.1		9.91 a	7.20	0.23	8.17	3.78
	7.7		11.21 b	7.22	0.18	8.18	3.86
		1	10.77 ab	7.18 a	0.25	8.14	4.33 a
		6	9.35 a	7.25 b	0.45	8.19	4.38 a
		12	14.12 b	7.22 ab	0.05	--	--
		24	10.11 ab	7.20 a	0.05	8.20	2.76 b
		48	8.47 a	7.22 ab	--	--	--

ANOVA, *Pr* > F

Temp (T)	0.5913	0.7739	0.1637	0.5091	0.1230
pH (P)	0.0415	0.0588	0.7471	0.4542	0.6566
Time (Tm)	0.0053	< 0.0001	0.4578	0.0555	0.0009
T x P	0.3704	0.0300	0.7534	0.9723	0.9444
T x Tm	0.1170	0.3682	0.5191	0.5365	0.1792
P x Tm	0.0684	0.1501	0.2182	0.6228	0.7010
T x P x Tm	0.0685	0.0025 ⁴	0.2519	0.8923	0.9549

¹Response variables are tissue TCO₂ (mmol kg⁻¹); tissue pH; tissue lactate (mmol kg⁻¹); blood pH; and blood lactate (mmol L⁻¹); ²*Pr* > F, p-value for differences among means within Time (Tm), different letters within time points indicate significant differences (p < 0.05); ³Least squares means within each main effect (temperature, pH, or time), different letters indicate significant differences (p < 0.05); ⁴For significant T x P x Tm interaction, means with different letters within each T x Tm setting are different (p < 0.05).