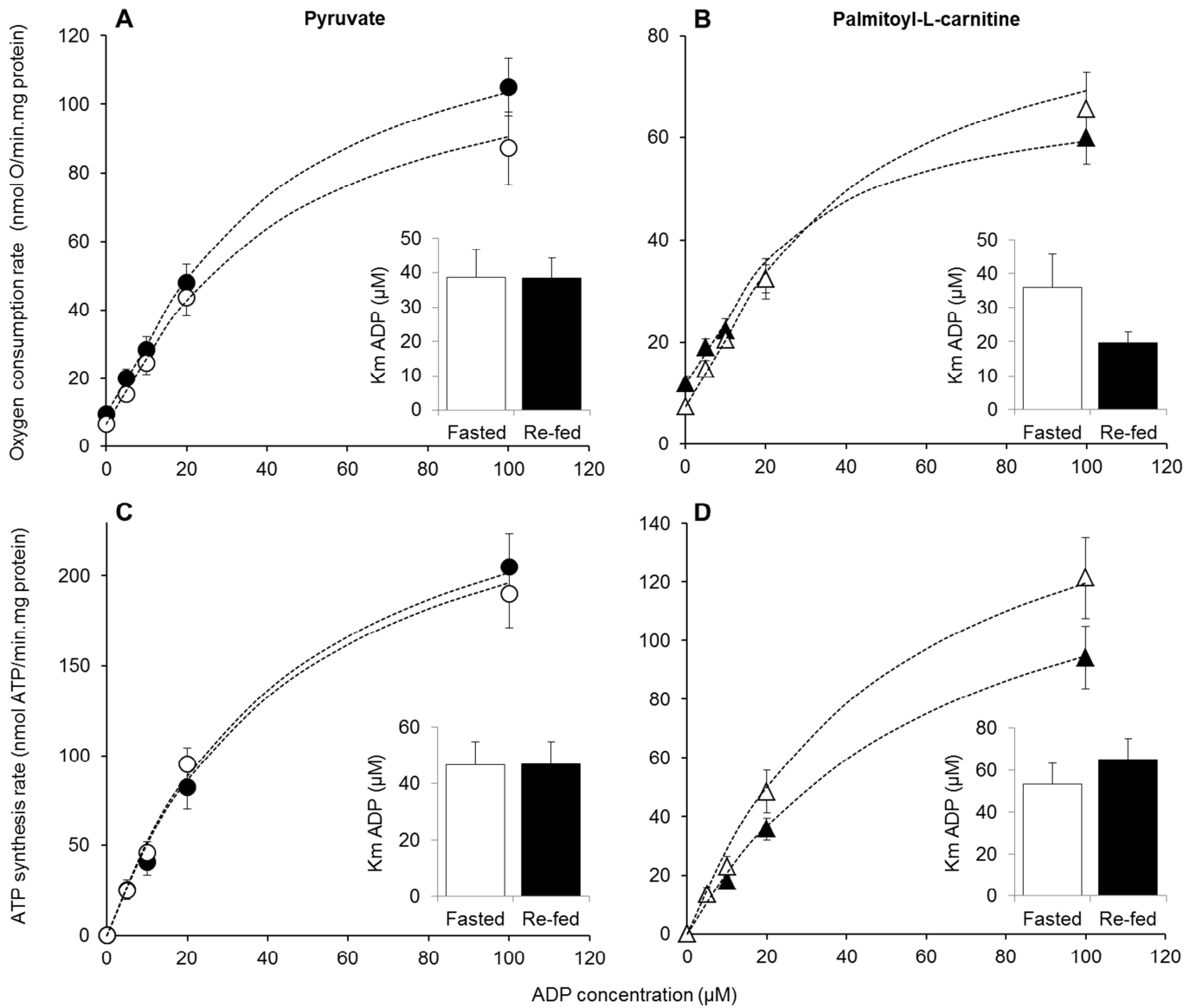


## Supplemental data 1

### Mitochondrial kinetics parameters of fasted versus re-fed king penguin chicks

The rates of respiration (panels A-B) and ATP synthesis (panels C-D) were measured at 38°C over a range of ADP concentrations with either pyruvate/malate (panels A and C) or palmitoyl-L-carnitine/malate (panels B and D) in the presence of glucose (20 mM) and hexokinase (1.5 U/ml). Mitochondria were isolated from pectoralis muscle of fasted (open symbols) or re-fed chicks (closed symbols). Inset: Apparent affinity constant for ADP ( $K_m$ ) expressed in  $\mu\text{M}$ . Values are means  $\pm$  S.E.M. for  $n=11$  (fasted) and  $n=9$  (fed) independent mitochondrial preparations.



## Supplemental data 2

### Effects of temperature on mitochondrial kinetics parameters

The rates of respiration (panels A-B) and ATP synthesis (panels C-D) were measured at 38°C (open symbols) and at 30°C (grey symbols) over a range of ADP concentrations with either pyruvate/malate (panels A and C) or palmitoyl-L-carnitine/malate (panels B and D) in the presence of glucose (20 mM) and hexokinase (1.5 U/ml). Mitochondria were isolated from pectoralis muscle of fasted chicks. Inset: Apparent affinity constant for ADP ( $K_m$ ) expressed in  $\mu\text{M}$ . Values are means  $\pm$  S.E.M. for  $n = 5$  independent mitochondrial preparations. \* indicates significant different between the two thermal conditions.

