**Effect of a summer heatwave on the field metabolic rate and water turnover of a small avian desert granivore.**

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Global environmental change is leading to not just higher mean temperatures but also an increase in the frequency, intensity and duration of extreme weather events, which may have a considerable impact on biodiversity. Effective environmental management therefore requires an understanding of the physiological response of organisms to extreme environmental conditions. Arid-adapted zebra finches can accommodate consecutive days of maximum Ta of40-45°C, without major impacts on energy or water balance, so long as drinking water is available. In fact, cooler periods during a summer drought pose a greater energetic challenge than a heat wave due to the increased thermoregulatory cost of maintaining Tb against a thermal gradient. Zebra finches limited or avoided activity during the most thermally challenging periods of the day. Their pre-emptive feeding and drinking in preparation for hours of relative inactivity at high Ta, together with a high body water content that provided a buffer against dehydration, enabled zebra finches to survive and maintain body mass during a heatwave. The predictability of upcoming periods of high Ta, together with a high body water content, may be essential for survival of heatwaves by small desert birds.

**Notes**