

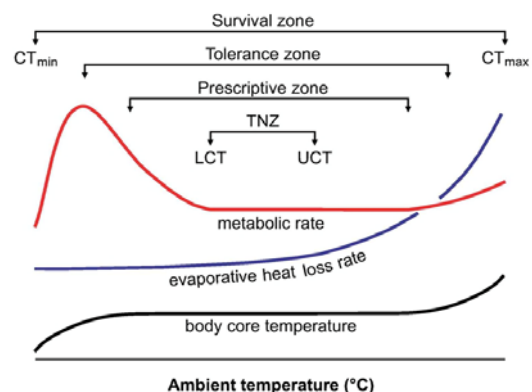
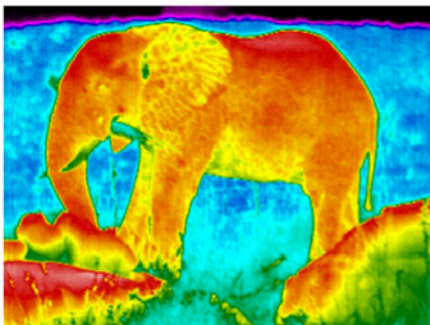


Revisiting thermal physiology: misconceptions in predicting responses of mammals to climate change

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Reliably predicting animal responses to climate change requires us to incorporate the principles of heat transfer and thermoregulation properly into the predictive models. In analyzing the thermal physiology behind some models that predict the responses of large terrestrial mammals, we have uncovered numerous misconceptions in influential models: underestimation of radiant heat transfer, misassignment of evaporative cooling, misinterpretation of the thermoneutral zone, confusion of upper critical temperature, overestimation of the metabolic energy cost of evaporative cooling, too high rank to homeothermy amongst homeostatic mechanisms, failure to appreciate how size and shape will change as climate change advances, misassumptions about skin temperature and misconceptions about the relationship between core temperature and its variability with body mass. One explanation for the misconceptions is that the vast literature on thermal physiology of humans has been underexploited in models for other large mammals. We believe that preventing the misconceptions propagating will improve model reliability, especially as models progress beyond their current typically-static format to include genetic and epigenetic adaptation and phenotypic plasticity.



Tuesday June 19th at 15.00

Aarhus Institute of Advanced Sciences