

## LIST OF SYMBOLS

$A_{Ld}$	surface area receiving longwave sky radiation ( $m^2$ )
$A_{Lu}$	surface area receiving longwave terrestrial radiation ( $m^2$ )
$A_p$	projected surface area perpendicular to the solar beam ( $m^2$ )
$A_s$	surface area receiving scattered shortwave radiation ( $m^2$ )
$A_{sr}$	surface area receiving reflected shortwave radiation ( $m^2$ )
$A_t$	total surface area ( $m^2$ )
$a$	major axis of a prolate spheroid (m)
$B_T$	total of all possible benefits attained during a given time interval (units?)
$b$	minor axis of a prolate spheroid (m)
$C_T$	total of all possible costs accrued during a given time interval (units?)
$c_p$	specific heat of air ( $10^3 J kg^{-1} ^\circ C^{-1}$ )
$d$	characteristic dimension (m)
$E$	total evaporative water loss ( $g m^{-2} s^{-1}$ )
$e$	eccentric of a prolate spheroid (m)
$\dot{H}_{AP}$	cost of active perching ( $kJ h^{-1}$ )
$\dot{H}_b$	basal metabolic rate ( $kJ h^{-1}$ )
$H_{db}$	total daily basal metabolism ( $\dot{H}_b \times 24$ hours; kJ)
$\dot{H}_{F>3}$	cost of flights $> 3$ sec. duration ( $kJ h^{-1}$ )
$\dot{H}_{F\leq 3}$	cost of flights $\leq 3$ sec. duration ( $kJ h^{-1}$ )
$H_f$	energy content of food swallowed (kJ)
$\dot{H}_H$	cost of hopping ( $kJ h^{-1}$ )
$\dot{H}_i$	cost of incubation ( $kJ h^{-1}$ )
$\dot{H}_m$	flux density of metabolic heat at the skin surface ( $W m^{-2}$ )
$\dot{H}_{na}$	cost of nest attendance ( $kJ h^{-1}$ )
$\dot{H}_{PM}$	cost of molt ( $kJ h^{-1}$ )
$\dot{H}_{PO}$	cost of ovogenesis ( $kJ h^{-1}$ )
$\dot{H}_R$	cost of running ( $kJ h^{-1}$ )
$\dot{H}_r$	cost of roosting ( $kJ h^{-1}$ )
$\dot{H}_{RP}$	cost of rest perching ( $kJ h^{-1}$ )
$\dot{H}_S$	cost of standing ( $kJ h^{-1}$ )
$H_{TD}$	total daily energy expenditure (kJ)
$H_{Tf}$	total cost of foraging (kJ)
$\dot{H}_t$	cost of thermoregulation ( $kJ h^{-1}$ )
$\dot{H}_{uf}$	unit cost of foraging ( $kJ h^{-1}$ )
$\dot{H}_W$	cost of walking ( $kJ h^{-1}$ )
$h$	hour angle of the sun (degrees)
$K$	diffusion coefficient for heat transfer from a flat plate in laminar flow
$K_a$	air temperature ( $^\circ K$ )
$L_d$	sky longwave irradiance ( $W m^{-2}$ )
$L_u$	terrestrial longwave irradiance ( $W m^{-2}$ )
$m$	body mass (g)
$Q$	total incoming radiation ( $W m^{-2}$ )
$R_{abs}$	flux density of absorbed radiation ( $W m^{-2}$ )
$r$	radius (m)
$r_a$	boundary layer resistance ( $s m^{-1}$ )
$r_b$	whole body thermal resistance ( $s m^{-1}$ )

$r_c$	coat thermal resistance ( $\text{s m}^{-1}$ )
$r_e$	equivalent resistance ( $\text{s m}^{-1}$ )
$r_r$	radiative resistance ( $\text{s m}^{-1}$ )
$r_t$	tissue resistance ( $\text{s m}^{-1}$ )
$S_p$	direct shortwave irradiance ( $\text{W m}^{-2}$ )
$S_r$	reflected direct and scattered shortwave irradiance ( $\text{W m}^{-2}$ )
$S_s$	scattered shortwave irradiance ( $\text{W m}^{-2}$ )
$S_{Td}$	global radiation ( $\text{W m}^{-2}$ )
$T_a$	air temperature ( $^{\circ}\text{C}$ )
$T_b$	body temperature ( $^{\circ}\text{C}$ )
$T_e$	equivalent blackbody temperature ( $^{\circ}\text{C}$ )
$T_{lc}$	lower critical temperature ( $^{\circ}\text{C}$ )
$T_n$	thermoneutral zone ( $^{\circ}\text{C}$ )
$T_{uc}$	upper critical temperature ( $^{\circ}\text{C}$ )
$t$	time (h)
$t_{AP}$	time spent active perching (h)
$t_{Fl}$	time spent on flights $> 3$ sec. duration (h)
$t_{Fs}$	time spent on flights $\leq 3$ sec. duration (h)
$t_f$	time spent foraging (h)
$t_H$	time spent hopping (h)
$t_i$	time spent incubating (h)
$t_{na}$	time spent in nest attendance (h)
$t_{PM}$	the time interval for estimating the cost of molt (h)
$t_{PO}$	the time interval for estimating the cost of ovogenesis (h)
$t_R$	time spent running (h)
$t_r$	time spent roosting (h)
$t_{RP}$	time spent rest perching (h)
$t_S$	time spent standing (h)
$t_t$	time during which thermoregulation is required (h)
$t_W$	time spent walking (h)
$u$	wind velocity ( $\text{m s}^{-1}$ )
$x$	ratio of the prolate spheroids minor to major axis
$\alpha_L$	absorptivity of surfaces to longwave radiation
$\alpha_s$	absorptivity of surfaces to shortwave radiation
$\beta$	latitude of the study area (degrees)
$\delta$	solar declination (degrees)
$\epsilon$	emmissivity of the animal's surface
$\eta_{Af}$	achieved foraging efficiency
$\eta_E$	exploitation efficiency
$\eta_{Rf}$	required foraging efficiency
$\theta$	the angle between the direct solar beam and the major axis of the prolate spheroid (degrees)
$\lambda$	heat of vaporation ( $2.43 \text{ MJ kg}^{-1}$ )
$\rho_a$	density of air at $20^{\circ}\text{C}$ ( $1.2 \text{ kg m}^{-3}$ )
$\rho$	reflectance (radiation)
$\sigma$	Stephan Boltzmann constant ( $5.67 \times 10^{-8} \text{ W m}^{-2} \text{ }^{\circ}\text{K}^{-4}$ )
$\tau$	transmittance (radiation)