

This is an appendix to the paper by Key & Ross 1999 Sex differences in energy expenditure in non-human primates. *Proc. R. Soc. Lond. B* **266**, 2479-2485.

Electronic appendices are refereed with the paper. However, no attempt has been made to impose a uniform editorial style on the appendix.

ELECTRONIC APPENDIX A: DATA AND DATA COLLECTION

In order to assess both short-term (daily energy expenditure) and long-term (the energetic cost of reproduction) energy demands, the following data are required: male and female activity budgets, male and female body mass, day range, gestation length, weaning age and inter-birth interval. These data were primarily collected from the literature; Data and data sources are shown in tables 1 and 2. A complete data set was available for 19 haplorhine primates, representing a good cross-section of genera: 7 Cebidae, 8 Cercopithecidae, 1 Hylobatidae and 3 Hominidae.

Only data from wild populations were used for activity budgets, male and female body mass and day ranges. Activity budget data were taken from the available literature, which usually divides activities into time spent sleeping, resting, moving, feeding and socialising. In two instances (*Callicebus torquatus* and *Ateles paniscus*) time spent socialising was not recorded. In many studies a small percentage of activity time was recorded as unknown. In these cases, it was assumed that the various activities performed during the unknown period occurred in the same proportion as during the observed period. It is noteworthy that time spent sleeping is 50% in nearly all cases. Since animals are rarely watched during the night, it is unclear whether they really are inactive for the whole of this time or whether other activities, such as socialising, occur. In the absence of data, it is assumed that this time is devoted only to sleeping.

Every effort was made to collect data on other parameters from the same study site as used for the activity budget data, or, if this was not possible, from an ecologically similar site (table 2). In some instances data from captive populations were also used for inter-birth interval and weaning

age, although this was avoided wherever possible. In many cases gestation lengths from captive animals were used, as these values are generally more accurate than those estimated from wild animals. For a few species, it was not possible to find gestation lengths, and in the following cases mean values for related species of the same size were used (shown in brackets): *Ateles paniscus* (*Ateles* mean), *Brachyteles arachnoides* (*Ateles* mean), *Callicebus torquatus* (*Callicebus moloch*) and *Colobus badius* (*Colobus polykomos*). Similarly, in the absence of data, lactation length of *Callicebus moloch* was used for *Callicebus torquatus*. Body mass data were not always available from the same site as used for activity budget data. In these cases data from nearby populations of the same subspecies were used. Body masses are mean values for each group, and hence do not take seasonal weight fluctuation into account. Ideally the influence of such fluctuations on metabolic costs would be calculated, but the lack of detailed data for most species makes this impossible here.

Table 1. *Time budget data*

(Values are expressed as percentage of day spent feeding (F), resting (R), moving (M), socialising (So) and sleeping (Sl). Study sites are shown under the species names).

	males					females					references ^a
	F	R	M	So	Sl	F	R	M	So	Sl	
Cebidae											
<i>Alouatta caraya</i> Estancia Casa Branca, Brazil	4.5	37.5	5.5	2.5	50.0	6.5	36.0	6.5	1.0	50.0	1
<i>Alouatta palliata</i> Panama	8.5	36.0	3.5	2.0	50.0	10.0	36.0	2.5	2.5	50.0	2
<i>Aotus trivirgatus</i> Peru	28.8	12.0	7.0	2.0	50.0	28.8	12.0	7.0	2.0	50.0	3
<i>Ateles paniscus</i> Manu National Park, Peru	11.3	23.8	15.0	0.0	50.0	15.6	22.7	11.7	0.0	50.0	4
<i>Brachyteles arachnoides</i> Minais Gerais, Brazil	9.8	33.0	10.3	1.1	45.8	9.8	31.4	11.9	1.1	45.8	5
<i>Callicebus torquatus</i> Nanay River, Peru	11.6	24.0	6.3	0.0	58.0	12.1	24.0	6.1	0.0	58.0	6
<i>Lagothrix lagotricha</i> Columbian Amazon	13.0	9.5	26.0	3.0	50.0	9.7	9.1	30.0	1.1	50.0	7
Cercopithecidae											
<i>Cercopithecus aethiops</i> Windy Ridge Game Park, South Africa	15.9	22.4	8.7	3.1	50.0	19.4	15.2	10.4	4.4	50.0	8
<i>Cercopithecus mitis</i> Cape Vidal, South Africa	12.5	23.4	11.5	2.6	50.0	18.2	16.1	11.2	4.6	50.0	9
<i>Erythrocebus patas</i> Kala Maloue NP, Cameroon	15.0	25.5	9.0	0.5	50.0	15.0	21.5	11.5	2.0	50.0	10
<i>Macaca radiata</i> Bandipur, India	15.0	21.5	3.0	10.5	50.0	25.5	7.5	5.0	12.0	50.0	11
<i>Papio anubis</i> Gilgil, Kenya	24.5	9.5	8.0	8.0	50.0	29.3	3.8	7.8	9.3	50.0	12
<i>Papio cynocephalus</i> Mikumi, Tanzania	21.1	13.0	13.2	2.8	50.0	20.5	11.3	13.0	5.3	50.0	13
<i>Colobus badius</i> Gombe, Tanzania	11.0	34.0	2.0	3.0	50.0	15.5	28.0	2.0	4.5	50.0	14
<i>Presbytis entellus</i> Ramnagar, India	16.3	32.2	1.1	0.4	50.0	16.1	29.7	1.2	3.0	50.0	15
Hylobatidae											
<i>Hylobates lar</i> Khao Yai NP, Thailand	10.0	29.5	7.0	3.5	50.0	18.0	22.0	7.5	2.5	50.0	16
Hominidae											
<i>Pongo pygmaeus</i> Kutai, Indonesia	26.8	15.3	4.4	0.5	53.0	18.9	21.0	5.7	1.4	53.0	17
<i>Gorilla gorilla</i> Rwanda	30.6	15.0	3.3	1.0	50.0	29.6	15.2	3.7	1.8	50.0	18
<i>Pan troglodytes</i> Gombe, Tanzania	27.8	8.9	6.9	3.1	53.3	30.3	8.9	4.4	3.1	53.3	17

^aReferences: 1. Bicca-Marques & Calegario-Marques (1994); 2. Milton (1980); 3. Wright (1978); 4. McFarland Symington (1988); 5. Strier (1987); 6. Kinzey *et al.* (1977); 7. DeFler (1995); 8. Baldellou & Adan (1997); 9. Lawes & Piper (1992); 10. Nakagawa (1989); 11. Singh & Vinathe (1990); 12. Bercovitch (1983); 13. Rasmussen (1985); 14. Clutton-Brock (1974); 15. M. Chalise (Pers. Comm.); 16. Nettelbeck (1993); 17. Leonard & Robertson (1997); 18. Watts (1988).

Table 2. *Species specific data for body weight, day range, gestation length (gest), weaning age (wean) and inter-birth interval (ibi).*

(Data collected from the same study site as used for activity budget data are in **bold**; data from wild animals from other sites are in plain text; data from captive animals are underlined).

species	body weight (kg)		day	gest	wean	ibi	references ^c
	males	females	range (m)	(days)	(days)	(days)	
Cebidae							
<i>Alouatta caraya</i>	6.42	4.33	454	<u>187</u>	<u>305</u>	<u>339</u>	1
<i>Alouatta palliata</i>	7.80	6.60	443	<u>186</u>	365	519	2
<i>Aotus trivirgatus</i>	0.80	0.78	710	<u>187</u>	<u>305</u>	339	3
<i>Ateles paniscus</i>	9.11	8.44	1977	226	811	1052	4
<i>Brachyteles arachnoides</i>	9.61	8.07	1283	226	641	1031	5
<i>Callicebus torquatus</i>	1.28	1.21	820	167	183	365	6
<i>Lagothrix lagotricha</i>	7.28	7.02	3000	<u>225</u>	<u>317</u>	<u>641</u>	7
Cercopithecidae							
<i>Cercopithecus aethiops</i>	5.51	4.09	1195	<u>163</u>	365	488	8
<i>Cercopithecus mitis</i>	6.80	3.50	1217	<u>140</u>	549	730	9
<i>Erythrocebus patas</i>	12.40	6.50	2000	<u>167</u>	214	365	10
<i>Macaca radiata</i>	6.67	3.85	518	<u>162</u>	305	365	11
<i>Papio anubis</i>	25.10	13.30	5000	180	365	412	12
<i>Papio cynocephalus</i>	21.80	12.30	5900	<u>173</u>	519	653	13
<i>Colobus badius</i>	10.50	7.00	557	186	677	778	14
<i>Presbytis entellus</i>	19.80	15.60	894	200	741	878	15
Hylobatidae							
<i>Hylobates lar</i>	5.90	5.34	1246	213	730	1095	16
Hominidae							
<i>Pongo pygmaeus</i>	77.90	35.60	305	<u>250</u>	1830	2562	17
<i>Gorilla gorilla</i>	162.50	97.50	400	260	1098	1434	18
<i>Pan troglodytes</i>	42.70	33.70	2700/3500^b	<u>235</u>	1464	2013	19

^b Day range for *Pan troglodytes* is given for females and males respectively.

^cReferences: 1. Shoemaker (1978, 1982), Bicca-Marques & Calegario-Marques (1995); 2. Smith (1977), Crockett & Eisenberg (1987), Smith & Jungers (1997); 3. Hunter *et al.* (1979), Robinson *et al.* (1987); 4. McFarland Symington (1988), Smith & Jungers (1997); 5. Strier (1992, 1993), Smith & Jungers (1997); 6. Robinson *et al.* (1987), Smith & Jungers (1997); 7. Mack & Kafka (1978), Defler (1987), Robinson & Janson (1987), Smith & Jungers (1997); 8. Melnick & Pearl (1987), Smith & Jungers (1997); 9. McLeod (pers. comm.), Rowell (1970); 10. Sly *et al.* (1983), Chism *et al.* (1984), Nakagawa (1989), Smith & Jungers (1997); 11. Simonds (1965), Smith & Jungers (1997); 12. Melnick & Pearl (1987), Smuts & Nicolson (1989), Smith & Jungers (1997); 13. Wasser & Wasser (1995), Rhine (1997), Smith & Jungers (1997); 14. Struhsaker & Leland (1987), Smith & Jungers (1997); 15. Winkler *et al.* (1984), Oates (1994), Borries (1997), Koenig *et al.* (1997); 16. Leighton (1987), Nettlebeck (1993), Palombit (1995); 17. Rodman (1977), Martin (1981), Galdikas & Wood (1990), Markham (1990), Smith & Jungers (1997); 18. Fossey & Harcourt (1977), Stewart & Harcourt (1987), Smith & Jungers (1997); 19. Rodman (1984), Goodall (1986), Smith & Jungers (1997).

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