Supporting Information

Fonseca-Azevedo and Herculano-Houzel 10.1073/pnas.1206390109

Table S1. Estimates of number of daily hours of feeding required for viability of different primate species, given their body mass and the number of brain neurons

Species	M_{BD}	Feeding per day, h	Feeding, kCal/h*	N_{BR}	Required daily feeding, h†
Callithrix jacchus	0.37	3.24	10.3	0.6 billion	2.4
Saimiri sciureus	0.72	1.32	41.5	3.2 billion	3.5
Aotus trivirgatus	0.78	6.36	8.9	1.5 billion	3.0
Cebus apella	3.1	2.92	55.8	3.8 billion	4.0
Macaca fascicularis	4.5	4.08	52.8	3.4 billion	4.2
Macaca radiata	5.3	3.60	67.5	3.8 billion	4.4
Papio cynocephalus	17.8	5.50	100.0	10.9 billion	5.8
Homo habilis‡	33.0	—	—	40.0 billion	7.5
Australopithecus afarensis‡	38.0	—	—	34.7 billion	7.4
Paranthropus boisei‡	41.0	—	—	32.8 billion	7.4
Pan troglodytes	44.0	6.80	175.6	27.5 billion	7.3
Pongo pygmaeus	57.2	7.20	202.0	32.6 billion	7.8
Homo erectus‡	58.0	—	—	62.0 billion	8.6
Homo sapiens‡	70.0	—	—	86.0 billion	9.3
Homo heidelbergensis‡	71.0	—	—	75.9 billion	9.1
Homo neanderthalensis‡	72.0	—	—	84.8 billion	9.3
Gorilla gorilla	124.7	7.8	334.7	33.4 billion	8.8

M_{BD}, body mass (from refs. 1–3); N_{BR}, total number of brain neurons, determined directly (refs. 4–6) or estimated (ref. 7).

*Estimated energy intake per hour spent feeding daily (*Materials and Methods*).

†Number of daily hours of feeding estimated to render viable the given combination of body mass and number of brain neurons.

‡*H. sapiens* and extinct hominins.

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7. Herculano-Houzel S, Kaas JH (2011) Gorilla and orangutan brains conform to the primate cellular scaling rules: Implications for human evolution. *Brain Behav Evol* 77(1):33–44.

Table S2. Maximal viable combinations of body mass and numbers of neurons depending on the number of hours spent feeding per day

Feeding hours	Maximal body mass	Maximal no. of brain neurons
1	10 g	6 million
2	49 g	514 million
3	297 g	2 billion
4	1.1 kg	5 billion
5	2.9 kg	11 billion
6	7.6 kg	23 billion
7	13.0 kg	34 billion
8	23.7 kg	53 billion
9	40.1 kg	79 billion
10	64.2 kg	113 billion

Calculations consider that the total energetic cost of the animal is the sum of the energetic cost of the body $E_{BD} = 70\ M_{BD}^{0.750}$ and $E_{BR} = 6 \times 10^{-9}$ N, which has to be supported by the total energetic intake $E_{IN} = H \times 25.352\ E_{BD}^{0.526}$.

Table S3. Maximal numbers of neurons that a primate of a given body mass could afford depending on the number of hours spent feeding per day

	Feeding hours				
M_{BD}, kg	4 h/d	6 h/d	8 h/d	10 h/d	12 h/d
0.5	5 B	11 B	16 B	22 B	28 B
1	5 B	14 B	22 B	30 B	39 B
2	5 B	17 B	29 B	41 B	53 B
5	4 B	20 B	40 B	60 B	79 B
10	NV	20 B	48 B	76 B	105 B
15	NV	16 B	52 B	87 B	122 B
20	NV	12 B	53 B	94 B	135 B
25	NV	7 B	53 B	99 B	145 B
50	NV	NV	45 B	111 B	178 B
75	NV	NV	30 B	112 B	194 B
100	NV	NV	12 B	107 B	203 B
150	NV	NV	NV	89 B	207 B
200	NV	NV	NV	65 B	202 B
250	NV	NV	NV	38 B	192 B
300	NV	NV	NV	8 B	178 B
350	NV	NV	NV	NV	160 B

Calculations consider that the total energetic cost of the animal is the sum of the energetic cost of the body $E_{BD} = 70\ M_{BD}^{0.750}$ and $E_{BR} = 6 \times 10^{-9}$ N, which has to be supported by the total energetic intake $E_{IN} = H \times 25.352\ M_{BD}^{0.526}$. When $E_{IN} < (E_{BD} + E_{BR})$, the animal is not viable. B, billion; E_{BD}, body energy expenditure; E_{BR}, brain energy expenditure; E_{IN}, caloric intake; M_{BD}, body mass; NV, not viable.